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QUICK CUTS
SUB PLOTS

article by Estelle Shay

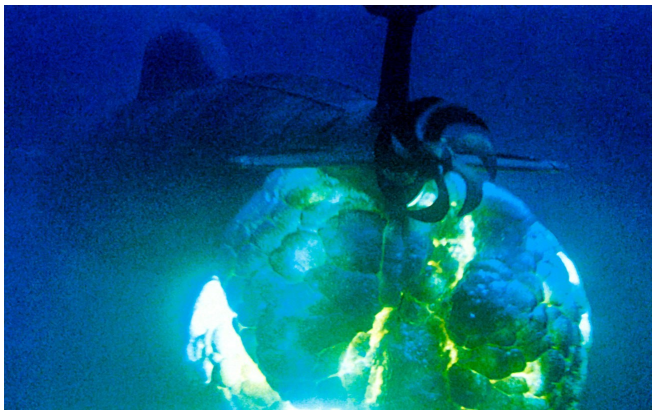
The Soviet Union and Communism have crumbled. But the threat of nuclear war looms large when rebel Russian nationalists stage a coup and capture several nuclear missile silos. Such is the backdrop for *Crimson Tide*, a tense drama played out on the nuclear submarine U.S.S. Alabama, engaged in a deadly cat-and-mouse game with a rogue Russian attack sub.

To depict the enormous submarines featured in the production, director Tony Scott marshaled the talents of effects supervisor Hoyt Yeatman and his Dream Quest *Images* crew. Most of the ninety-seven effects shots would be accomplished with a combination of dry-for-wet and wet-for-wet model photography. “We knew from the start that we would be relying heavily on models as opposed to digital effects,” observed model shop supervisor David Goldberg. “Computer graphics still aren’t at the point where you can get all the nuances of detail that you get with model and stage photography without an enormous investment in workstations, time and manpower.”

Goldberg, assisted by lead modelmaker Mike Stuart and model shop foreman John Hess, was tasked with constructing a fleet of five dry-for-wet models for filming on Dream Quest’s gantry motion control stage. “Since Tony wanted to shoot from a variety of angles and distances,” Goldberg explained, “we built three of the U.S. Trident and two of the Russian Akula in varying scales, the smallest measuring four feet and the largest twenty-four. We discovered very early in testing, however, that distant shots using the smallest models just didn’t look real. As a result, we abandoned those and concentrated on our two big hero models.”

Using photographs of real nuclear submarines for reference, Goldberg designed blueprints for the models in his computer, then transferred the data to a laser-cutting device capable of making parts with speed and precision. “A real nuclear sub is just enormous – nearly four stories high and two football fields in length – and since our subs would be photographed at close range, they had to look big. But there was not a lot of fine detail to lend visual scale. So we built them from the inside out, with bulkheads and plank-on-frame construction, to convey a sense of the methods used in building a real sub.” To produce a strong but lightweight miniature, modelmakers used clear acrylic for the bulkhead framing, then wrapped the ribs in slices of thin styrene plastic vacuformed with fine ripple detailing to mimic the surface characteristics of a real submarine.

During filming, Yeatman and his crew filled the gantry stage with heavy smoke lit to simulate the murky ocean at varying depths. Shots of the Alabama were generally accomplished with the model rod mounted from below, while the smaller Akula model was suspended on wires from the gantry system. Certain shots – such as closeups of torpedoes flying past camera – could not be shot on stage. "Tony really wanted the dynamic that you get with something real in the water," Goldberg observed, "so we built seven-foot-long third-scale torpedoes and filmed them wet-for-wet at the L.A. Swim Stadium." To match the smoky stage environment, the effects crew added tempera paint to the pool water and built a structure over the deep end so that lighting conditions could be artificially controlled. The torpedoes were outfitted with onboard drive systems and air-driven propellers that operated off a valve release. "That still didn't move them fast enough, so our physical effects supervisor, John Gray, set up a pneumatic winch to pull the models on guide wires at speeds in excess of forty miles an hour."



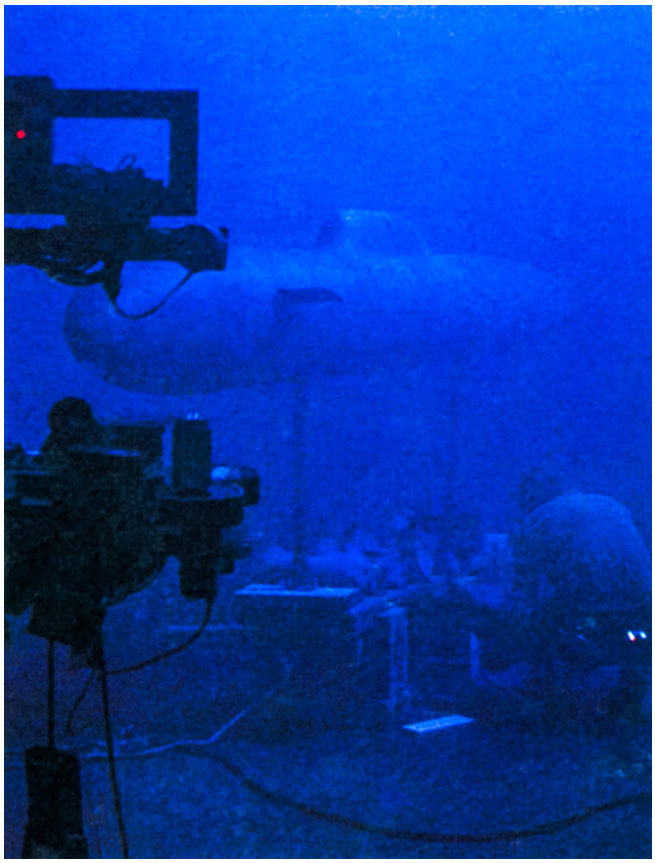
A Russian submarine is torpedoed in Crimson Tide. Dream Quest Images used models – shot both wet and dry – plus sophisticated digital imagery to produce the film's many underwater effects.

Also shot in the pool was a climactic sequence in which the Akula is destroyed by a direct torpedo hit. "If a real sub was struck by a torpedo while submerged at depth," Goldberg observed, "the concussion from the blast and the immense water pressure would literally crush the hull like a tin can. So we had to show what this very large object would look like imploding from stern to bow. That had never been done before."

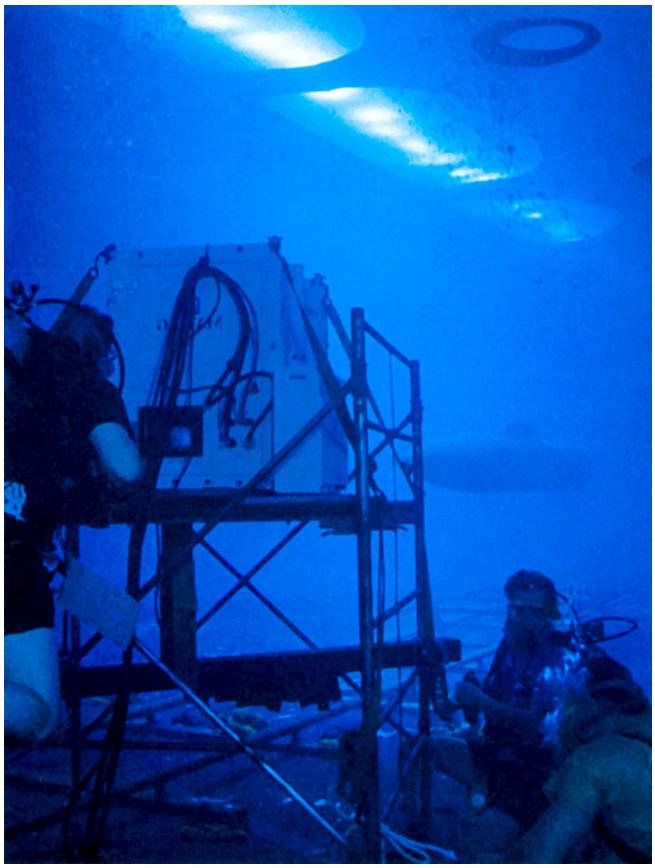
To accomplish the effect, lead modelmakers Jim McGeachy and Ken Swenson constructed three identical, slightly larger versions of the Akula, each measuring twenty feet in length. “We used an aluminum framework,” Goldberg explained, “and down the center of each we positioned seven glass vacuum bell jars, stacked end to end. On each jar, we placed a dozen very small explosive charges, just powerful enough to shatter the glass.” Around the skeletal framework, the modelmakers fashioned the boat completely out of thin sheet lead, pounding it into fiberglass molds to produce the required compound curves.

Transporting the model from Dream Quest’s Simi Valley studio to the L.A. Swim Stadium was a delicate affair. “The sheet lead was only one-thirty-second of an inch thick,” noted Goldberg, “so it was extremely fragile. We ended up building large wooden carts that held the models about four feet up in the air. Once at the pool, the entire cart and assembly was craned into the shallow end, then rolled into deep water so the submarine could be floated off the top.” Another hurdle was the model’s extreme buoyancy – a result of the water displaced by the vacuum jars. “We ended up having to add about three hundred pounds of lead to the model, which still wasn’t enough to sink it. To hold the still buoyant sub in place, an underwater track assembly was constructed by John Gray so the model could be held down by wires.”

With the submarine in position, Gray rigged a number of explosive charges, including a large balloon filled with blasting powder for the primary fireball. “When it came time to do the shot,” said Goldberg, “everybody cleared out of the pool. Up to that point – as a safety consideration – the vacuum jars still had one atmosphere of air in them. We hooked them up to an underwater umbilical hose and used a vacuum pump on the surface to extract the remaining air. Then *I* dove down and disconnected the umbilical.” To move the submarine through the frame, the model was propelled along



The Russian sub is photographed dry-for-wet on a smoked motion control stage at Dream Quest.



the track on an underwater dolly hooked by tow cables to a dolly on the surface. When grips pushed the surface dolly, the movements were translated to the sub.

Its destruction by implosion was filmed wet-for-wet in a large swimming pool.

Although the sequence, as planned, would occupy just six seconds of screen time, the actual explosions took far less. “Something like twenty-four events make up the sequence,” Goldberg commented, “all of them occurring within one-quarter of a second. First the fireball engulfs the tail of the sub; then another explosion blows the propeller off the back. Next the glass vacuum jars fire in sequence from stern to bow, shattering and crumpling the hull to create the implosion effect. Then explosives blow out through the hull to simulate the engine room and the armament in the bow of the ship blowing up.” Computer previsualization – using a virtual submarine designed by digital supervisor Dan DeLeeuw – enabled Yeatman to choreograph the sequence down to the microsecond. “To execute it,” noted Goldberg, “our engineering supervisor Fred Iguchi built a system using a computerized relay board so that the timings could be entered in the computer and played back in real time, triggering each explosion at the appropriate millisecond.”

The sequence was shot using two high-speed Vistavision cameras and two four-perf cameras for tight detail shots. “On our first try,” Goldberg recalled, “there were a few timing issues and Tony wanted bigger explosions. We made some modifications to the remaining two models and shot the sequence again three weeks later. That one went off without a hitch, so we never had to blow up the third model.”

Although most of the underwater effects in *Crimson Tide* were achieved with model photography, Dream Quest’s digital team, supervised by Dan DeLeeuw and CG animator Darin Hollings, contributed to more than fifty shots. *In* addition to wire and rod removal and digital compositing, they imported stage motion control data into 3-D software to create a number of CG torpedoes and torpedo-fighting countermeasures, a two-mile-long trailing antenna on the Alabama, escaping bubbles, torpedo wakes and a distortion effect behind the model subs shot on stage.

Bringing all of its diverse resources to bear on *Crimson Tide*, Dream Quest provided a level of realism in the underwater sequences that helped to sell the human drama at the heart of the film. “Although this is an effects-heavy movie,” stated Goldberg, “the most important thing is the interaction of the characters on the sub. Everything else is merely background.”

QUICK CUTS
CINEMATIC CYBERSPACE

article by Sean Dever

The stories and novels of 'cyberpunk' author William Gibson have enthralled readers with their mix of science fiction and fact ever since they first began appearing in the mid-eighties. Written in a sharp and engaging style that tends toward the visual, these works are well-suited to the screen. Johnny Mnemonic – directed by Robert Longo from a screenplay by Gibson – is the first of several planned film adaptations. The futuristic adventure follows its title character, a bio-enhanced courier, in a desperate flight down an information highway where the boundaries between reality and cyberspace have blurred.

It was Gibson's notion of cyberspace – featured prominently in all his works – that presented the filmmakers with their biggest effects challenge. By the writer's definition, cyberspace encompasses a sort of virtual space between the world in which we live and the world inside the computer. More than just an environment where data is stored, cyberspace has many of the characteristics of a real city. Characters in *Johnny Mnemonic* have physical experiences in the cyber world much as they do in the real world – although they are really just hooked into a sort of hyper-Internet, a vast computer bulletin board.

A pivotal sequence in the film has Johnny (Keanu Reeves) manipulating his way through the cyberworld in an attempt to discover who has stored a lethal load of data on a silicon chip in his head. Consisting of eighteen shots with nearly two minutes of computer graphics animation, the sequence was created at Sony Pictures Imageworks under the direction of effects producer George Merkert and visual effects supervisor John Nelson. Depicting cyberspace in the visual medium of film – something that had never before been done – was a challenge the two relished from the start. *Ironically*, it was not the first attempt for Merkert.

"I've always been a major William Gibson fan; so in 1990, *I* jumped at an offer from producer B.J. Rack and Carolco to work with James Cameron on Burning Chrome, based on a collection of Gibson short stories. Tim McGovern and *I* put together a twenty-second test-of-concept piece on our ideas for visualizing cyberspace; but then financing for the project crumbled, and Cameron left to direct *Terminator* 2. Ever since then, *I*'ve never stopped thinking or talking about how we might do it if we ever got another opportunity." That opportunity came when Merkert learned that Rack was once again involved in a Gibson project. "*I* called her up to inquire about it, and she said: 'You guys would be perfect. We could pick up where we left off!'"

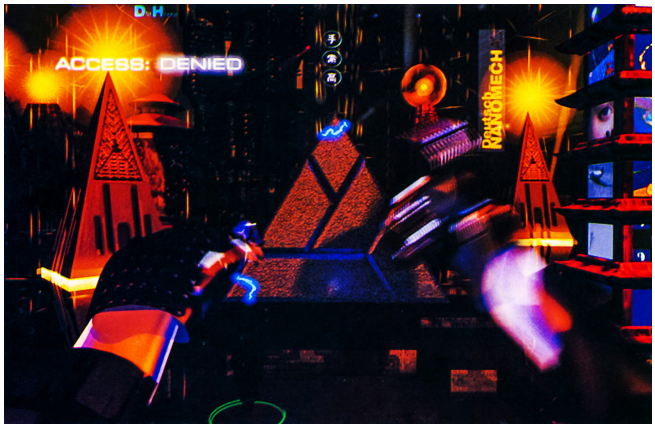
With input from Longo and production designer Nilo Rodis, and with Gibson's descriptions to guide them, SPI honed a design concept of cyberspace that extrapolated certain elements from current technology in order to provide easily identifiable visual cues audiences could relate to. "It's not like the story is set millions of years in the future," Nelson noted, "just far enough so that things are still undefined. We tried to suggest a sort of a three-dimensional expansion of Windows so that people could recognize the computer environment of the future as an extension of something we have today – only nicer and more refined."

Upper-level Cyberspace, one of three computer generated environments created by Sony Pictures Imageworks for Johnny Mnemonic.

Considerable design inspiration came from the emerging field of virtual reality. Nelson flew to Silicon Valley to meet with people at New Leaf Technologies where he acquired a first-hand feel for the medium by performing a virtual gallbladder operation. "In VR, everything is very tactile," said Nelson. "You feel as if you can actually touch and manipulate things. So we tried to incorporate that tactile feeling into our designs."

The creative team also endeavored to strike a balance between the high-tech glossiness of a computer world and the gritty look of a futuristic city. "*Robert* Longo was very adamant that the cities of the future would not exist above ground, but rather on the Internet," said Nelson. "So we came up with three different cyberspace urban environments, each one like a distinct geographic region with different visual characteristics. Upper-level Cyberspace is cool and corporate looking; Cyber Beijing is like downtown Tokyo, commercial and glossy; and Cyber Newark is post-industrial, smoky and smoggy."

With cyberspace visually established, Nelson – in collaboration with art director Jamie Rama, and later with effects editor Edgar Birksen – story-boarded a series of shots that covered Gibson's plot points and intercut with live-action footage of Keanu Reeves, in virtual reality goggles and data-gloves, moving as if he were navigating through the cyber environment. The storyboards were shot on video and cut into the live-action sequence to create an animatic, then refined further with computerized production designs rendered by Rama. Computer generated versions of the actor's gloved hands were visible in the cyberspace shots and later choreographed by animators to match his hand movements. "We wanted to create the feeling that Keanu was like the conductor in *Fantasia*," Nelson noted, "with ultimate control over this whole world through his hands."



Johnny attempts to move through Cyber Beijing, a digital environment created – like others in the film – entirely with personal computers.

With designs completed, a decision was made – due to budget and time constraints – to execute the entire eighteen-shot sequence on a PC platform running Autodesk's 3-D Studio. "*I* had to talk the production into it," Nelson admitted. "They were very concerned about PC quality. But in the end, they got tremendous value for their dollar and were delighted with the results. We found a way to accomplish just about everything we wanted using the PC, and the 3-D Studio software provided excellent detail and subtlety. We got about eighty to eighty-five percent of what we would have been able to achieve with an upper-level platform – at about one-half the cost."

Tackling the computer graphics animation was SPI's previsualization and multimedia department under the supervision of production manager Frank Foster and lead technical directors David Worman and Matt Hausle. The assignment was a departure for the team, ordinarily charged with working out the timing and blocking of scenes in rough layout form. Leading the effort was artist and animator Brummbear, who texture-mapped, constructed buildings and detailed Upper-level Cyberspace and Cyber Beijing. Tim Miller did the same for Cyber Newark, while David Worman and Glenn Campbell animated Johnny's hands.

Images were rendered using 3-D Studio. "The program had features that made the rendering relatively painless," Nelson observed. "At the end of the day, the animator would just type 'slave' – and his computer would go from workstation to slave function, automatically spitting out renders." Frames were rendered at 1K resolution and output to film at 4K by way of custom filters written by the research and development department. "We've come up with ways to enlarge images that are very, very good." With ten desktop PCs and a tower of ten PCs strung together, animators had access to a combined net power of over twenty machines. "*I* could even render on my laptop – which was pretty amazing."

To finalize the sequence, Jamie Rama painted effects into the rendered images, supplying details such as glows or flashes of light whenever the data-gloves touched something in the cyberspace environment. "Having an art director who was computer literate was really liberating," Nelson observed. "With 3-D animation, you often spend ninety percent of your time getting close; but that last ten percent can be really arduous. *In* those instances, *I* could ship a shot over to Jamie, and tell him, 'Just paint it.'" Since Rama had produced many of his initial designs for the sequence digitally, paintings and reference materials were also available on-line for the animators to refer to as they worked.

For SPI, Johnny Mnemonic was a fulfilling project on several fronts. *It* was an opportunity to participate in the first filmed version of William Gibson's much-admired work and to create a whole new visual context for his concept of cyberspace. *It* was also the perfect vehicle to illustrate what can now be achieved with relatively low-end digital tools. "The production must have liked what we did," Nelson concluded, "because they came back to us later to redesign the opening sequence as a point-of-view ride along the information superhighway. *I* had a feeling that PCs were capable of doing some pretty impressive stuff – and that proved to be the case. So often we assume that the success of digital effects depends on the impressiveness of the tools. But the most important factor isn't software and it isn't hardware – it's people. And we have a great team here."

QUICK CUTS
THIRTY SECONDS OVER ZAIRE

article by Estelle Shay

When Arnold Kopelson was edged out for the movie rights to The Hot Zone – Richard Preston's true account of a killer virus scare – the producer responded by commissioning a movie script of his own based on a similar, but fictional, premise. The result was Outbreak, a scientific thriller directed by Wolfgang Petersen and starring Dustin Hoffman, about a deadly out-of-control virus that threatens to wreak havoc worldwide.

Outbreak opens with a dramatic flashback to a 1967 mercenary encampment in Central Africa where the lethal virus first appears. Under the pretense of delivering medical supplies, a U.S. military team eliminates the threat by parachute-dropping a fuel air bomb – second only to a nuclear weapon in destructive force – on the remote camp and its unsuspecting inhabitants. Tasked with creating the blast sequence, along with numerous other effects shots, was Boss Film Studios. "Later in the story, an American city is threatened with a similar bomb," observed Neil Krepela, who co-supervised the work with Jim Rygiel, "so it was important to *Wolfgang* that the audience fully comprehend the immense power of the explosion."

For shots of the fuel air bomb being dropped, Boss created computer generated models of the bomb and parachute, as well as the delivering C-47 aircraft. "This was one of several sequences where we resorted to digital aircraft – instances where it was just too expensive or impractical to acquire real planes," Krepela explained. "We started with a database from Viewpoint which was fairly low-rez; so we had them redigitize to a higher number of polygons. Then we went in and beefed it up, adding a lot more points of reference. We also modeled in several of our own special features, such as rocket pods. Model shop supervisor Dave Jones and matte department supervisor Michele Moen took great care to ensure realism down to the smallest detail, checking the Viewpoint data for accuracy, creating texture maps to individualize each plane, painting in such minutia as oil drips, grease smears, rust on the rivets, mud on landing skids, even fingerprints on the windows."

For the blast effect, Krepela and Rygiel studied footage of actual nuclear and fuel air bombs, analyzing the distinct stages of such explosions, from the initial flash that causes whatever is in its path to smolder to the shock wave and final concussion of moving air that blows everything apart. "The closer you get to the epicenter," said Krepela, "the more these events appear to occur simultaneously. So, in our scenario, we had to stretch reality a bit in order to get them all in."

Conceived as a practical effect, the explosion was staged in the Boss Film parking lot under the supervision of pyrotechnician Bill Klinger. Two separate effects were needed – a magnesium blast to represent the initial flash, and then a large-scale black powder blast. Both were filmed against a black backing from various angles and at several different speeds using a Photosonics camera. "The black powder device consisted of a small pile of fine-grain powder on an electric mesh, with blasting powder heaped on top," Krepela observed. "The fine-grain powder would burn very fast and ignite the blasting powder. The blasting powder – which had larger granules that burned much slower – would shoot out burning chunks into the air and create a dandelion-like puff of white smoke with streamers and a hot-orange core." Achieving an explosion of appropriate size and scope was strictly a matter of trial and error. "We added gunpowder each time we tried it," recalled visual effects line producer Chris Brown. "Finally, Neil said, 'Okay, why don't you double what you just did.' The next blast gave us our shot – but we set off car alarms in the neighborhood and knocked dishes off a cupboard in a nearby house."

Infected with a deadly virus, a mercenary encampment in Zaire is destroyed with a fuel air bomb in an effects sequence produced by Boss Film Studios for Outbreak.

To reveal the devastation at close range, three large-scale miniature sets were erected indoors at Boss. Fashioned under the direction of Dave Jones and leadman Alan Faucher, the sets represented different views of the compound – a mercenary infirmary, a fuel supply area and a watchtower. "We wanted to incorporate as much realism and detail as possible," Jones commented, "so we used quarter-scale for all but one foreground thatchedroof piece. The rule of thumb is that when you're dealing with fire, flames or water, you don't want to go below one-third scale. But this kind of explosion didn't involve a lot of flames; and even at quarter-scale, two of the sets were massive – each measuring sixty by thirty-four feet." Since the real sets used for live-action filming had yet to be built, only a few preliminary drawings and reference stills of the terrain were available. "We had to take those and flesh them out with designs and details that the production would be able to match later on."

The miniatures were built lightweight, using a combination of natural and artificial materials, so that air cannons could easily destroy them. "I had modelmakers Rachel Kelly and Laura Grijalva leading teams out to scour the woods for sticks to construct our fences and use as building supports," Jones recalled. Another challenge was the construction of a miniature vehicle for the fuel supply area. Designed by Dave Emery and Jason Kaufman to match a real Land Rover used in the live-action, the model featured a full underside with

collapsible rubber tires and a working suspension that could compress to flatten the tires when the blast hit. "Because we did several takes of each explosion, many of the set pieces were built in multiples; but the Land Rover was so labor-intensive that we ended up building just one – making parts of it sturdy enough to withstand the blast so that we could reconstruct it in a day."

Crew members prepare for a multi-pass bomb simulation which will include miniature sets and props plus a digitally blown-apart human.

Filming the miniatures required precise timing and more than fifteen separate passes. "We wanted to incorporate all the bomb stages we had observed in our reference footage," Jones remarked, "so we had to do separate passes." Hot lights were focused on the set for an initial light pass, followed by a smoke pass using A/B smoke – two caustic agents sprayed on the models to create small clouds of rising smoke. To simulate the dust kicked up by the shock wave as it traveled across the frame, fog machines pumped high-pressure water mist into boxes cooled with dry ice, creating a dense groundhugging cloud. "We positioned the machines just out of frame and then filmed the fog at a very slow camera speed so the dust appeared to travel across the set simultaneous with the shock wave."

In a final film pass, air mortars and wire pulls rigged by Evan Jacobs and Jon Warren effected the actual blast and lateral movement of debris. Building supports broke apart, roofs peeled back, miniature trees toppled and the Land Rover rolled. After a first take, the process was repeated twice on each set so that adjustments and refinements could be made. "We would shoot a take, then have one day to clean everything out and rebuild while we set up and shot one of the other sets."

With the practical effects and miniature work completed, digital artists composited the separate passes, removing wires and, in one shot, adding a morphing effect. "We wanted to show the devastating impact of the blast on a human being," explained digital effects supervisor Sean Phillips, "so we filmed an actor against a greenscreen and then matted him into the Land Rover shot. At the moment the blast hits, we morphed to a computer generated person by texture-mapping the final frame of the actor onto the CGI version. Then we broke the 3-D image into pieces – limbs, head, torso, even some uncoiling intestines that come out of his mid-section. So you actually see him blow apart." Finally, the shots were integrated into helicopter footage of the full-size camp set built on location in Hawaii, with layers of distortion added to the background plate for a more realistic blend. Additional digital manipulation was required for two subsequent shots. An exploding fuel dump shot live was warped and stretched to better match the shots preceding it; and several small fires were composited onto a digital matte painting for a final aerial view of the destruction.

In addition to its big-bang opening, Outbreak had at least thirty other visual effects engineered by Boss – many entailing complex computer generated 3-D models. "This was an exceptional show for us," commented Krepela, whose pioneering company, under the guidance of founder Richard Edlund, recently restructured its operations and expanded its digital capabilities. "*I* think all of the shots are virtually flawless. *I*t's not often that you can claim one-hundred-percent satisfaction with the way a project turned out."

PROFILE
JEFF MATAKOVICH

article by Mary C. Mason

In an industry that embraces all things digital, Jeff Matakovich, founder of Optical Illusions, remains a staunch advocate of traditional optical techniques. “It’s not that *I*’m opposed to digital technology,” asserted Matakovich, whose shop also houses two *Indigo II* computer workstations and recently added a Solitaire *III* film recorder. “It’s just that *I* think you have to use the right tool for the job and strike a balance between the two methods in order to maximize the capabilities of both. You have to look at a shot and weigh the advantages of one method over the other.”

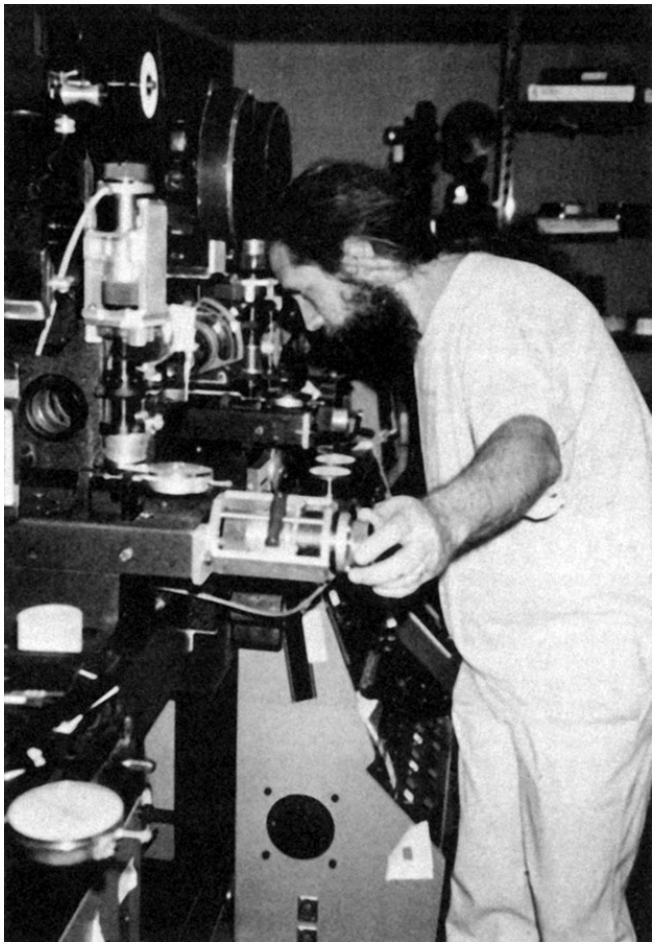
Matakovich’s twenty years of experience in visual effects began at Humbolt State University in California where he studied filmmaking. “When *I* started out, *I* didn’t have any specific plans to go into visual effects or optical work. *I* simply enjoyed filmmaking and was anxious to work with film in any capacity. My first industry job was with a small animation house in *San Francisco* where *I* trained as an animation cameraman and editor. After about three years up there, *I* relocated to Hollywood and found work at the optical house of Ray Mercer & Company.” Assigned initially to the art department – setting up titles, mattes and artwork – Matakovich quickly assimilated other skills, graduating to camera work and opticals. “It was there that *I* got my first exposure to optical printing. *I* worked with Gene Lescher who had more than thirty years of experience shooting opticals. *It* was a great opportunity for me to learn from one of the best in the business. Then *Star Wars* came out and opened the optical floodgates.”

Matakovich spent the next few years gaining hands-on experience in early computer graphics with Robert Abel, whose facility during the late seventies and early eighties was at the forefront of visual effects. “We were using elements pulled from an Evans & Sutherland computer system – just black-and-white elements that were then put on the optical printer and mixed with live-action characters or backgrounds.” After varied stints with effects innovator Douglas Trumbull, and with *Illusion* Arts as a matte cameraman, Matakovich joined Dream Quest *Images* where he spent the next five years as optical supervisor on more than thirty films – including *The Abyss* and *Total Recall*, which earned Oscars for their visual effects.

In 1992, Matakovich decided to venture out on his own. “Dream Quest didn’t know if it was going to stay with photochemical opticals or make the transition to digital; and since *I* was in possession of a motion control four-perf and Vistavision Oxberry printer, *I* kind of eased myself out and took on a few small jobs of my own.” With his existing printer, plus some additional equipment he had purchased when Apogee closed its doors, Matakovich set up shop in Newberry Park, close to his Thousand Oaks home, and Optical *Illusions* was born. “*I* assembled a few choice people for a core crew and we started with *In the Line of Fire*. “Since then, the company has amassed an impressive roster of film credits, including Hot Shots! *Part Deux*, *Demolition Man*, *Speed*, *True Lies*, *Star Trek Generations* and Tall Tale. “Often an established effects company whose focus is primarily in the digital arena will determine that a particular shot can come together more effectively and cost a lot less if it is done optically. So they call us up and we put it together for them.”

Though digital capability is now on line at Optical *Illusions*, Matakovich is convinced that its cost can tip the scales unfavorably when compared to that of conventional opticals. "On *Star Trek* Generations, for example, there were a few shots with Vistavision elements – one in particular that was eight hundred frames long and had something like five passes. The filmmakers didn't want to scan all that material because it would have cost a small fortune. So we were asked to put the shot together optically, which enabled them to keep their costs way down. Although there are certainly advantages to doing effects shots on the computer, *I* am still convinced that the photochemical process is cheaper, faster and superior in quality. Compare a full resolution digital composite to a Vistavision optical composite and you'll find the optical composite still looks better – both in resolution and dynamic range."

Currently at work on a feature version of *The Mighty Morphin Power Rangers* – a big project with more than two hundred effects shots – Optical *Illusions* hopes to keep current in the digital realm while maintaining its niche as one of the few small optical houses still capable of doing Vistavision to four-perf compositing. "We have a good mix of tools and technology. *In* our work on *Tall Tale*, we not only did a lot of variations of digital greenscreen composites with photochemical composites, but we also ventured into 3-D animation. The digital revolution seems to have pretty much leveled the playing field. We're running software here that is identical to what's being run at many of the giant effects houses. Since every place has the same tools, what it comes down to is the talent sitting in front of the workstation – and there are some enormously talented people out there."

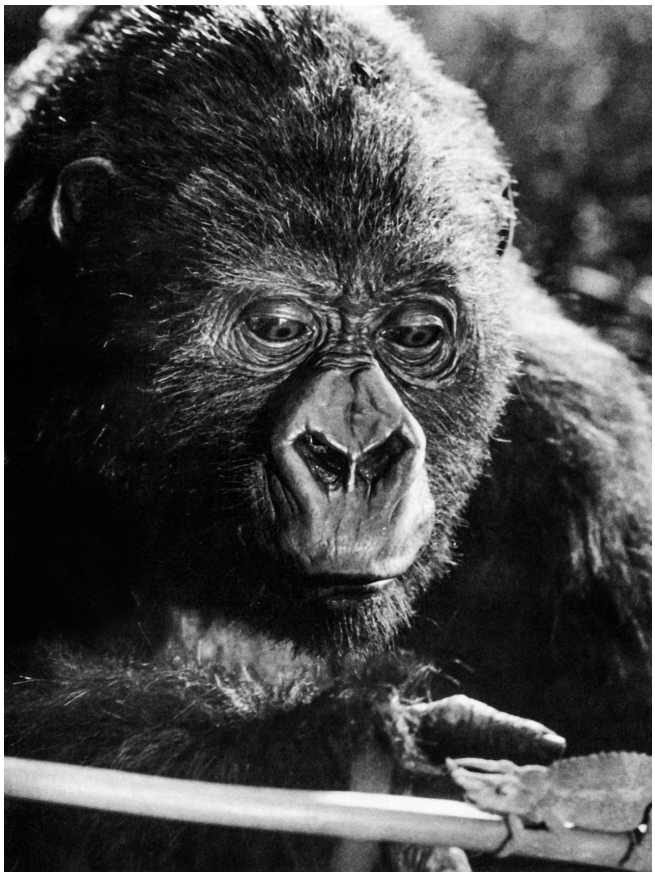


Jeff Matakovich of Optical Illusions readies his optical printer to composite a shot.

GORILLA WARFARE

image

article by
Jody Duncan

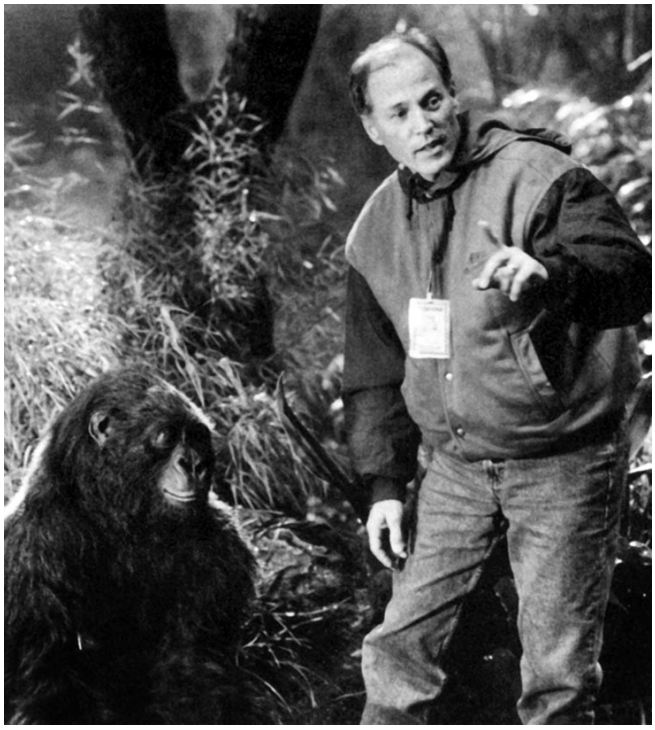


In Congo – an excursion into high adventure based on the Michael Crichton novel – a small expedition is formed to return a signing mountain gorilla named Amy to her native African rain forest. A central character in the film, Amy was portrayed by a performer in a realistic suit designed and built by Stan Winston Studio. Included was a radio controlled animatronic head capable of a wide range of expression.

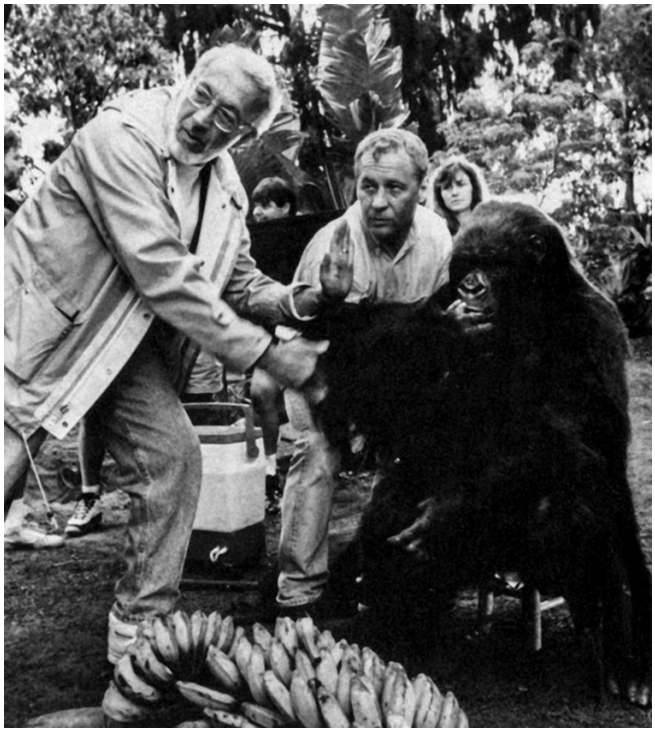
No novelist has seen his work translated to the screen as successfully as Michael Crichton. From his early *The Andromeda Strain* to The Great Train *Robbery* to the more recent *Jurassic Park*, *Rising Sun and Disclosure*, *Crichton's stories* have repeatedly made for riveting and popular movie fare. *Congo*, his 1980 bestseller, was as abundant in cinematic potential as his other works, containing all the standard elements of Crichton magic – the stamp of high-technology presented in a fascinating, yet understandable way, interesting characters and a compelling *Man vs Nature* battle. If ever a book was meant to be made into a movie, *Congo* was it.

Yet the project remained in developmental limbo for nearly fifteen years, despite its potential and the keen interest of Hollywood insiders. To some degree, blame for the inability to get *Congo* off the ground could be laid at the feet of a seven-year-old mountain gorilla named Amy. The lead character of Crichton's novel, Amy would also be a major character in the film adaptation. While Rick Baker had demonstrated the realism that could be achieved with animatronics and human performers portraying apes in both *Greystoke* and Gorillas in the Mist, no one had yet created an ape character that could withstand the lingering screen time that would be devoted to Amy.

Well schooled in the art and science of producing spectacularly successful effects films, Kathleen Kennedy and Frank Marshall finally took up the *Congo* gauntlet in 1993. Negotiating a deal with Frank Yablans, who owned film rights to the book, and Paramount Pictures, the two-year-old Kennedy/ Marshall Company immediately launched into production with Marshall directing and Kennedy and Sam Mercer producing. About that time, the filmmakers also secured commitments from Stan Winston, visual effects supervisor Scott Farrar of Industrial Light & Magic and special effects supervisor Michael Lantieri to handle the visual and physical effects. After approximately a year of preparation, the production began a four-and-a-half-



Director Frank Marshall confers with Amy on the set Creating the singular Amy performance entailed a well-rehearsed collaboration between the actor executing gorilla movements within the suit and three external puppeteers providing the facial articulations.



The entire Amy performance team trained for several months to create a convincing gorilla characterization. Film tests were conducted to finesse the performance prior

month shoot followed by a hectic three-month postproduction phase during which visual effects shots were completed.

to the start of principal photography. Stan Winston and primate choreographer Peter Elliott prepare Amy for a test.

In the film's title sequence, images of open savanna dissolve to reveal a small expeditionary party chopping its way through thick rain forest as it approaches the slopes of Mount Mukenko, an active volcano situated in the Virunga mountain range of Central Africa. The scientific team has been sent by TraviCom, a high-tech, high-powered communications company intent on locating chemically flawless diamonds to be used in future communications technologies. The story then moves to an American university where the Project Amy team, led by primatologist Dr. Peter Elliot (Dylan Walsh), has long been nurturing the gorilla Amy and has succeeded in teaching her sign language. Recently, however, Amy has been experiencing disturbing nightmares, and Elliot fears they are a sign of mental degeneration, a common occurrence in captive primates.

Virtually the star of the film, Amy was of primary concern as the *Congo* project went into development. After briefly exploring the feasibility of using a real gorilla to portray her, Frank Marshall opted to go with the proven approach of employing an actor in a realistic suit, with an animatronic head providing facial expression.

The process of designing Amy began at Stan Winston Studio with a series of concept drawings rendered by artist Miles Teves. To make Amy as appealing as possible, Winston rejected the notion of creating a character that was an entirely authentic representation of a mountain gorilla; rather, he guided the design toward a look that more closely resembled a lowland gorilla, whose shorter snout and rounder face made for a more attractive countenance.

As Winston and his team refined the design, primate choreographer Peter Elliott – whose name, coincidentally, was nearly identical to that of *Congo*'s lead character – conducted auditions with Marshall and the producers to find an actor capable of performing convincing simian behaviors inside the suit. Elliott had earned distinction as an expert in primate behavior and movement after conducting an eight-month-long research project for *Greystoke* in which he attempted to socially integrate into a community of chimps. In addition to choreographing the extended chimp sequences in that movie, Elliott had choreographed the gorilla performances in Gorillas in the Mist and the Early Man sequences in *Quest* for Fire. "Peter Elliott was one of the main reasons that this show went as smoothly as it did," Winston asserted. "He was the first person *I* brought in to meet Kathy and Frank. He has a complete understanding of ape movement and behavior, and that expertise was crucial to the success of *Congo*."

Over the course of several weeks, Elliott auditioned nearly eight hundred dancers, gymnasts, stunt people and actors, finally casting gymnast and aspiring actress Lorene Noh and gymnast-stuntwoman Misty Rosas who would share duties inside the Amy suit. With the crucial role cast, Winston and his artists took lifecasts of the two young women, from which the animatronic head and suit would be created. Amy's features were sculpted in clay, then cast in a specially formulated silicone that proved to be far superior to the standard foam latex. "We had tried test versions of silicone skins before," mechanical supervisor Richard Landon recalled, "but we'd always had interaction problems with the molds. Certain silicones do not react well in either silicone molds or molds that have sulfurbased clays. Tom McLaughlin and Richard Davison finally came up with

modifications of the silicone, developing the technology so there was no longer an inhibition problem – the skins always cured and they never came out like bubblegum or peanut butter. They were very soft, yet still had full shape memory. Tom and Richard also devised repair agents that allowed us to clean seams, just as we do with foam latex."

Beneath the silicone skin of the head was a carbon fiber understructure that held twenty-three servo motors to drive the radio-controlled facial articulation. All of the servos were powered by a battery pack located in the stomach area of the suit. Because Winston had determined that Amy would be most productive on the set if the character could be treated as any other actor, the mechanical challenge for Landon was creating a single hero head that could perform all of Amy's articulation. The approach was a major step forward for complex animatronic characters, which in the past had normally required a number of interchangeable heads, each capable of articulating one or two expressions. "The flexibility of the silicone skin, plus the advances we've made in radio technology and engineering, allowed us to create one head for Amy that could do almost everything," Winston noted. "An exception was a head we made for Amy screaming, which was used in only one or two shots."

An additional head was built specifically to be worn by Peter Elliott, who would portray Amy in some of the film's more demanding action sequences. "Peter's head had all of the same functions as the main Amy head," puppeteer Brock Winkless noted, "but it had to be oversized to fit him, and the larger head did not look quite as good as the more petite one. There were also a couple of stunt heads which had no mechanical works at all. We used those in long shots and when we didn't want to risk damaging the hero head."

Early in the construction process, Frank Marshall also requested a separate chewing head for Amy. "Frank said that it was very important that Amy be able to eat," Landon recalled, "because he was going to have her doing that quite a bit in the movie. So we built a head that had a sealed lip and side-to-side jaw action – which was something the hero head did not have." Due to the puppeteering expertise of Winkless, who operated the lips of the hero head, the chewing version was ultimately never used. "Brock was so good at operating the mouth on the hero head that he was actually able to simulate a chewing motion. We put bits of food on the edge of the lips, and Brock would manipulate them so that the food was folded right into the mouth. We got some wonderful shots of Amy eating bananas and celery that way."

The eyes for the Amy head were devised by Jon Dawe, who had produced all of the eye mechanisms for the dinosaurs in *Jurassic Park*. Because the relatively small gorilla head was already jam-packed, Dawe had to design the eye mechanisms in an odd configuration to make them fit. Servos to drive the eye movements were positioned on the top of the head and at the temples, while the mechanisms themselves wrapped around the performer's head like a pair of glasses. "We made the artistic decision of how large the iris should be in relationship to the rest of the eye," Dawe said, "and that gave us our design parameters. Taking those parameters, *I* designed the entire eye mechanism on the computer. We went through a lot of tests to get just the right look. The first couple we did were okay, but the eyes tended to look a little sinister because their color was so dark. We came up with another set that were colored a deep orange; and those were just beautiful." Cast out of resin, the eyeballs were painted in layers of orange, then covered in a polyester material to

create a three-dimensional lensing effect. Prior to each take, Windex was wiped onto the eyes with a fine brush to make them look wet and alive.

Long before Amy was due to make her first appearance on the set, Winston crew members constructed a test version of the head. Brock Winkless was then given a month to determine its strengths and limitations, as well as how well it would hold up with continuous use. As a result of lessons learned during the test period, Landon reconfigured some of the head mechanisms when it came time to build the final hero version for filming. Cheek mechanisms were added to help create more expression in the eyes; and stronger servos were used to drive the lips, resulting in faster, more responsive lip articulation.

Concurrent with the construction of the Amy head, Stuart Artingstall supervised the insertion and tying of yak hair into the body suits. Hand-punching of the hair for Amy and other gorillas in the film was a labor-intensive endeavor that took a crew of nine more than six months to complete. Amy's mixture of hair colors – browns, blacks and reds – was dipped into adhesive and punched into the silicone skin. "The silicone was so wonderfully translucent," Landon noted, "that punching the hair in created very natural follicles. The hairs came out at the proper angle, just as they would on a real animal." About two-thirds of the head was covered with a mesh lace piece that was fabricated separately and applied with silicone adhesive. "The mesh hairpiece worked well for areas of the head that didn't have motion, such as the top, the underside of the jaw, and the back and sides behind the ears. For areas where there would be motion, the head was covered in the silicone skin and hand-punched with hair." Throughout the head and body, the intrinsically black silicone was given a subtle paint job that included pink and gold highlights.

Beneath the hair suit, and over two-piece capilene garments to absorb moisture, the performers wore muscle suits – fabricated by a team headed by Karen Mason and Colleen Henry – to replicate the powerful chest, biceps and gluteus muscles of a gorilla. Aluminum and steel arm extensions were positioned inside the hair suit to simulate the elongated arms of a gorilla and to bear the weight for the actors walking as quadrupeds. Developed by Rich Haugen and Al Sousa, the extensions were equipped with mechanisms to allow for linkage-driven wrist articulation and cable-operated fingers.

Once the definitive head had been constructed, puppeteers Winkless, Dawe and Landon worked with the animatronic device on a fixed stand for two weeks, rehearsing specific expressions with Winston and Elliott. Landon, responsible for the movements of the nose, brows and cheeks, held a nine-channel radio controller. Dawe operated the eyes with a seven-channel radio. Winkless' controller for the mouth – one of the most expressive areas of Amy's face – was a custom fabrication devised by Dawe, Landon and Glenn Derry. "We had to be able to produce the gorilla-like 'hoot,' with the lips extending forward and inward from the sides – which is a movement you can't get from an ordinary four-joystick controller," Landon stated. "So we came up with our own controller. We took two Futaba seven-channel radios out of their original housings and mounted them to a new aluminum face plate, with joysticks mounted in the four corners so that Brock's index fingers could go on the top two joysticks and his thumbs could go on the bottom two. The upper two joysticks had linear potentiometers so we could push and release straight down on the joystick and get the specific hooting actions with the lips. That gave us two additional axes that hadn't been available before." Winkless wore the large controller strapped to his waist, supported by

a harness around his neck. To open and close Amy's jaw, he also wore a telemetry head unit that translated his jaw movements to the jaw of the animatronic head.

To aid in the development of Amy's behavior, the puppeteers studied videos of gorillas provided by Charles Horton of Zoo Atlanta, as well as National Geographic specials collected by the production. Numerous facial expressions – 'fear,' 'play face,' 'anger' and such – were rehearsed until the puppeteering crew could readily effect them on a beat. Just as artistic license had been taken in the design of Amy, some liberties were taken with her behavior as well. "Amy had to have a broad range of expression," Winkless noted, "so we gave her certain human characteristics. She had emotional reactions that were quite human – and quite unlike real gorillas. *In* watching countless gorilla tapes we learned that gorillas are predisposed to one certain expression. They do not, for example, have much eyebrow movement – but we needed that to make Amy more expressive. On the other hand, her mouth didn't have as much movement as a real gorilla's would have, just because it was very difficult to get that range of movement out of something mechanical. We had to discover as we went along how far we could push this humanistic aspect of Amy – and *I* think we pushed it a good long way. We were more concerned with creating the character of Amy than with creating a real gorilla."

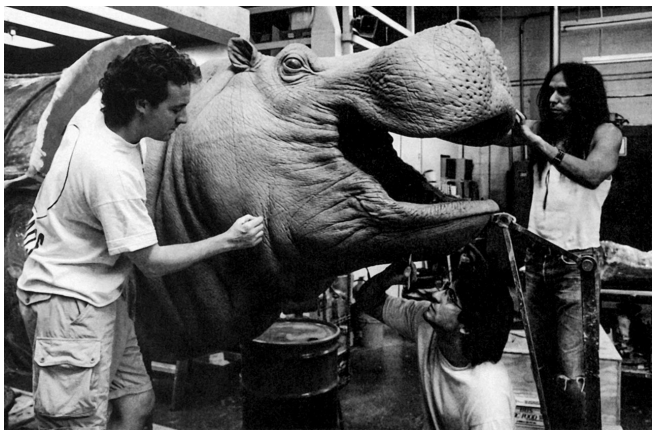
Just prior to moldmaking, Winston artist Miles Teves does a final cleanup on the sculpture used as the basis for construction of the animatronic Amy head. To heighten Amy's appeal, Frank Marshall and Stan Winston determined that her mountain gorilla design should incorporate some facial characteristics of the less fierce-looking lowland gorilla.

Sculptor Paul Mejias at work on the Amy body. From the sculpture, a multilayered suit was eventually devised. The completed suit consisted of a moisture-absorbing undergarment, a two-piece muscle suit that simulated a gorilla's body structure, and a hair suit made up of yak hair that was inserted by hand, one strand at a time, into specially formulated silicone skin.

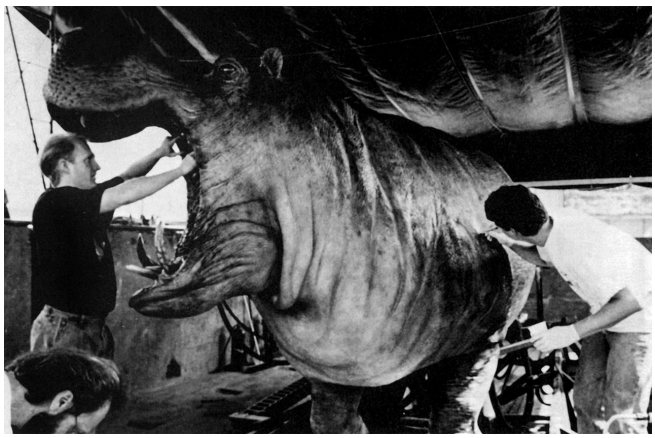
"There are a lot of nuances in a character like this that you just don't have to deal with in a space creature or monster," Dawe elaborated. "It doesn't require as much work to make something evil as it does to make it charming. There was a lot involved in getting a combination of servo motors, silicone flesh and yak hair to actually come through with the warmth and charm and playfulness of Amy. Amy was a creature of nature; and nature is always the hardest thing to replicate. There was a lot of subtlety to the performance. For us to capture an expression of feeling, the smallest subtle movements on Amy's head were sometimes the most powerful."

Building on what they had learned through their stationary rehearsals, the puppeteers refined their performance in a two-day film test period with Lorene Noh inside the suit. Another full day of video

tests was conducted in the lush foliage of Winston's own back yard. "We wanted to see what Amy would look like on film, in a jungle-like setting and moving all together, rather than just having the head on a stand," Landon explained. "Also, the film tests were useful for Allen Daviau, the director of photography, in determining how best to light Amy. Once we got to actually shooting, we refined what we had learned during the tests, deciding how emotive Amy needed to be for specific scenes and working out even more subtleties in the performance."

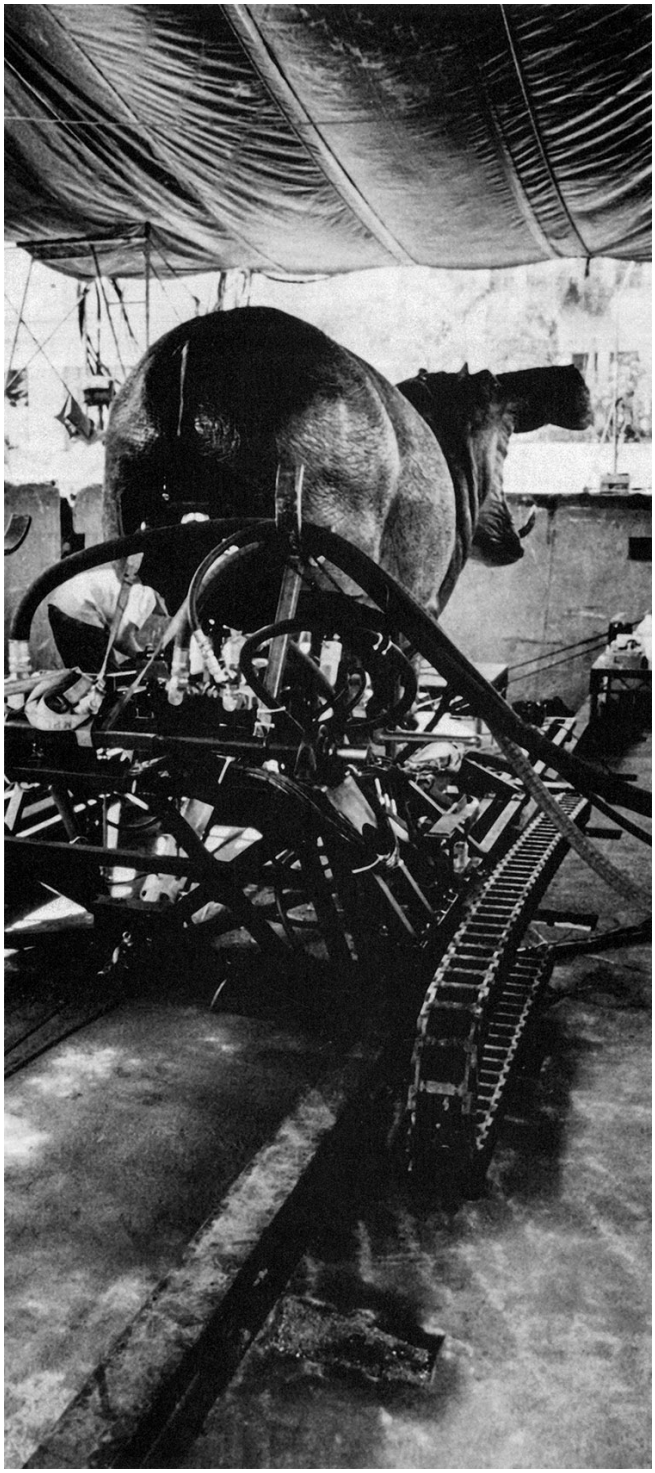


A hydraulically-powered behemoth was also devised by the Winston team for a scene in which expedition members are attacked by an enraged hippopotamus. Construction of the giant creature began with a full-size sculpture. Miles Teves, Paul Mejias and Joey Orosco detail the work in progress.



Kevin Hudson and Eric Ostroff patch the silicone skin of the hippo. Hydraulic mechanisms situated inside its steel understructure drove the large body movements, while smaller functions, such as ear twitching, were operated pneumatically.

On the set, the creation of Amy was a carefully orchestrated effort between Frank Marshall, Stan Winston, Peter Elliott, the three puppeteers and the performer – either Rosas or Noh – inside the suit. "For any one shot," Landon noted, "it took five people to deliver the Amy performance. It started with Peter's or Stan's concept of what should happen, based on Frank's direction; then we had either Misty or Lorene's physical interpretation of that idea; and finally, the three of us puppeteers coordinating to create the facial expression. Peter or Stan would call out instructions into an open mike so that everyone would hear them at the same time. We found that, most of the time, the performer's action had to lead ours. *If* Peter called for a look to the right, for example, the body language would start that move, and then the actress would move her head to the right as our radio-controlled expression followed suit." Since the performers' own eyes were completely covered, the head was equipped with a small fiber optic lens positioned unobtrusively in a corner of one of Amy's nostrils. Although the lens provided the women some visibility, its peephole-like quality distorted and diminished their vision considerably. Thus, they found it most useful to rehearse scenes first without the head so that they could count their steps and acclimate themselves to their surroundings. "During that first rehearsal, they would actually act the scene with their faces, doing all the appropriate facial expressions – which is the way Peter had rehearsed them. Then, once the head was on, we would do our best to repeat what they had done facially."



Filmed in an enormous tank at Paramount, the hippo was mounted to an underwater track system devised by special effects supervisor Michael Lantieri and crew. The rig enabled the hippo to travel twenty-five feet through the water, then surface and charge a raft carrying the actors.

Amy was put through her paces, both in the film and in the context of the story, in an early scene at the university. Before an assemblage of representatives from grants organizations, Peter Elliot conducts a demonstration in which Amy's sign language is translated into audible speech through a computer-linked glove. Amy's bravura performance that day, however, is marred for Peter by the nightmare she suffers that night. Deducing from her finger paintings of the jungle that Amy is homesick, Peter hurriedly arranges for an expedition into the

Congo. Financing the expedition is Herkermer Homolka (Tim Curry), a self-proclaimed philanthropist who secretly hopes that Amy may lead him to the lost city of Zinj, a legendary city reputedly surrounded by rich diamond mines.

Diamonds are also the focus of the TraviCom expedition and those monitoring its progress via satellite in Houston. Supporting the global communications environment of the TraviCom headquarters set – realized by production designer J. Michael Riva – was a vast array of hardware and software. With associate producer Michael Backes acting as liaison, $2.5 million in high-tech equipment was loaned to the production by Silicon Graphics. Charged with creating computer displays pertaining to TraviCom's global field operations were computer graphics supervisors Casey Cannon and Van Ling. Computer graphics obtained from actual satellite transmissions were played back through state-of-the-art central processing units and revealed on similarly high-tech LCD screens, both provided by Silicon Graphics. *In* addition to the authentic satellite graphics, the TraviCom monitors displayed field-oriented images from previous Kennedy and Marshall films such as *Arachnophobia*, *Alive* and *Jurassic Park*.

The expedition reports to TraviCom that the diamonds they are seeking have been found; but shortly thereafter, remotely operated cameras transmit images from the site showing nothing but dead bodies, a trashed camp and the blurred image of a gray ape-like creature. On orders to quickly resecure the diamonds, project supervisor Dr. Karen Ross (Laura Linney) links up with the Project Amy expedition. Once in Africa, the group is met by safari guide Monroe Kelly (Ernie Hudson) who has been hired to lead them into the rain forest. Joined by a team of native porters, they board a charter aircraft – which is attacked by guerrilla ground forces soon after takeoff.

Shots of guerrilla missiles firing at the plane were among the approximately ninety visual effects shots ILM would complete during a grueling twelve-week period – one of the shortest postproduction schedules ever tackled by the company. Scott Farrar – together with effects producer Ned Gorman and effects art director Claudia Mullaly – had been involved with *Congo* since August 1994, designing the effects sequences with Marshall and Kennedy. But the bulk of ILM's work – which centered around the eruption of Mount Mukenko – could not be started in earnest until well into February, after the production company had returned from Costa Rica with background plates of Mount Arenal, an active volcano that would double as Mukenko in the film. "We had to increase the size of our crews," Gorman commented, "and several of the departments worked six- and seven-day weeks. The model shop was particularly heroic, doing six-day weeks for a very long time to get ready for the three camera crews we had going simultaneously. It was unbelievably tight."

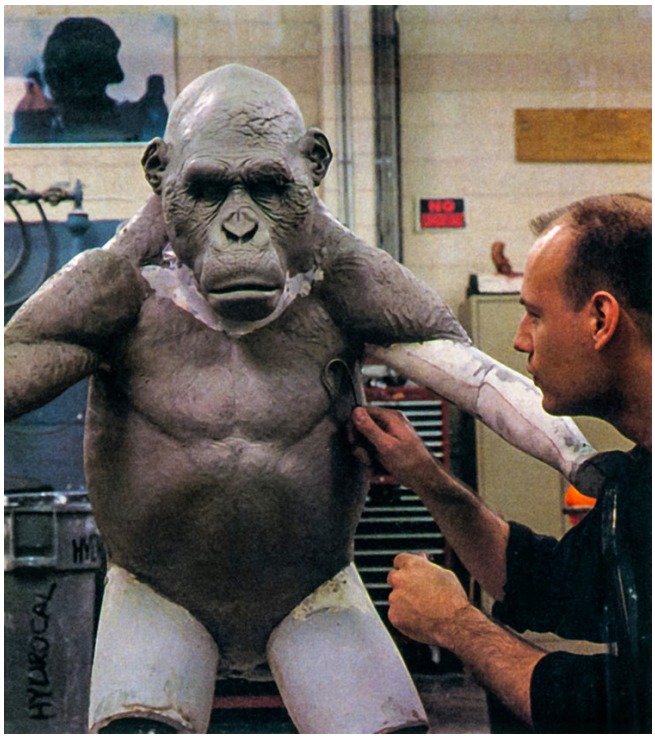
For the attack on the airplane, computer generated rockets and exhaust trails were composited into live-action plates. Rocket trails were modeled in three dimensions by technical director Dennis Turner, then rendered with a smoke shader. Pyrotechnic elements photographed on stage were used for the explosion that results when one of the rockets strikes its target. Those shots were then enhanced with Dynamation, a 3-D animation program, to create residual debris.

Moments before the plane explodes, the expedition members bail out over the jungle. Shot in the Costa Rican rain forest, the parachute landings required rigs devised by Michael Lantieri and his team. "We built rigs to hang our actors on," Lantieri said, "so we could actually lift them up about twenty feet – enough so they were out of frame – and then lower them down for shots of them

landing. We had real sky divers jump out of the plane for long shots, then used these rigs for closeups on the actors."

Surviving the drop, the team begins its foray through the rain forest, a trek that includes traversing the Ragora River on inflatable boats. On the river, the group encounters a raging hippopotamus, a larger-than-life-size robotic collaboration between Stan Winston Studio and the Michael Lantieri crew. Winston's team sculpted and built the creature, while Lantieri's developed the rigging needed to move it forward on a twenty-five-foot track mounted in a huge water tank at Paramount Pictures. The collaboration was similar to the one the companies had enjoyed while working on the T-rex for *Jurassic Park*. "Just like on Jurassic," Lantieri noted, "Stan's shop did the sculpting and the skins and devised the facial and body articulation, while we built the underwater track and the heavy hydraulics to move the hippo on it. This hippo not only had to rise up out of the water, it also had to flatten a boat and grab a porter and chew him up." Lantieri was additionally charged with filling the massive water tank – normally used as a parking lot – with a million gallons of water, as well as pumping it out when the hippo shoot was completed.

Within the rain forest the explorers stumble upon Zinj, an ancient city populated by a savage breed of gray gorilla. Twelve individualized 'grays' were designed by a team of sculptors at Stan Winston Studio. Chris Swift sculpts the head for one of them.



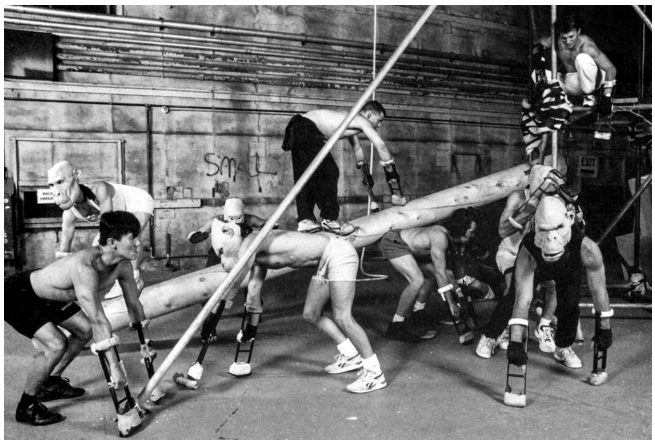
At the Winston studio, a life-size hippo was first fashioned in clay by a team of sculptors. Joey Orosco produced the head, John Rosengrant the body, and Paul Mejias and Miles Teves contributed to the detailing. Tim Nordella was responsible for the internal structure and mechanization. "Most of the articulation was in the head and neck," Nordella related. "The basic body was a rib-cage-type of structure that was egg-shaped. We put all the hydraulic equipment and the actuators for the movement in the center. In the back we had accumulators for high-response movement. The whole thing ran off of a single hydraulic power unit; but if we needed a lot of movement and were using up all of our power, the accumulator would give us that little extra boost. In the neck area, we had a parallelogram so that the neck could move to the left

or right and the head would move accordingly. There was a rotation at the base of the head so we could tilt it side to side or make it nod. The head also had ear-spin which we drove pneumatically. Compressed air was used to move the eyes and to make the nostrils flare. The jaw was hydraulically powered and could open about four feet wide." The structure was covered in a silicone skin painted with a mixture of thinned silicone and colored tints developed by Joe Reader. The paint mixture bonded closely with the silicone skin and thus was very durable under water.

lenses – to be used. Consequently, only two puppeteers were needed to operate each gray. Beth Hathaway fits a suit on one of the performers.

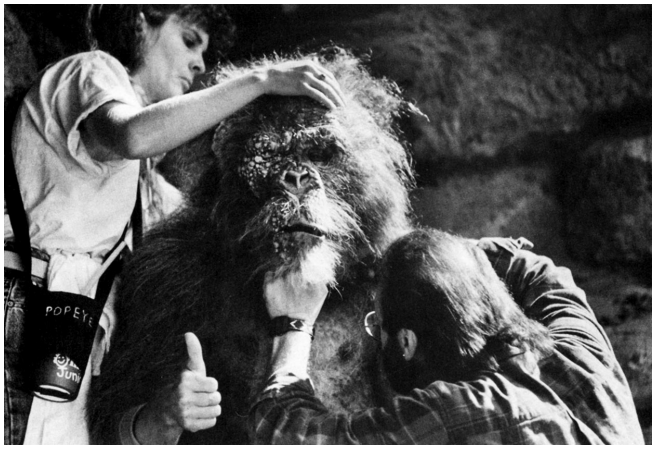
In addition to the attack hippo, ten 'floater' hippos – whose articulation was limited to ear movement – were built to represent the less volatile members of the herd. "The floaters were just dragged around in the water," Nordella noted. "Some of them were half-body floaters – just a head and neck – while others were full-body length."

Once the main hippo was positioned on Lantieri's underwater rig, four puppeteers were required to drive its forward motion and other functions. For the gross movement of the head and neck, Nordella operated a telemetry device that was linked to potentiometers placed on specific joints on the hippo's body. "The telemetry device would mimic the actual points of movement on the hippo's neck. *I* would put my hand into this device and grab a handle. Then, as *I* turned the handle in any particular fashion, the hippo's neck and head would do the same movement." Air-powered eye and ear movements were operated by Paul Romer. Joss Geiduschek controlled the raising and lowering of the hippo on the rig, while Emery Brown operated its forward movement.



The gray performers – actors, stuntmen, gymnasts and dancers – trained with Peter Elliott for a period of six months before cameras rolled. Training included rigorous upper-body strengthening and the comprehensive study of gorilla movement and behavior. Arm extensions were used in rehearsals to enable the performers to practice quadrupedal movement.

Those surviving the hippo attack finally make their way to the upper slopes of Mount Mukenko, where they experience a brief encounter with a silverback and three female gorillas. Suits and animatronic heads for the scene were sculpted by Joey Orosco and mechanized by Alan Scott. The scene was filmed on location in Costa Rica, with the silverback portrayed by key gorilla artist John Alexander, noted for his work as Digit in Gorillas in the Mist.



Incorporated into the design of the grays were physical deformities that would emphasize the diseased nature of the mutated species. One of the most prominently featured grays – nicknamed 'Popeye' – was cursed with an oozing, malformed eye. Judy Bowerman and Joe Reader suit up Popeye performer David St. Pierre.

Soon thereafter, the expedition finds the magnificent ruins of Zinj. Constructed on the massive Stage 15 at Sony Studios, the enormous set consisted of a gated entrance, a football-field-size courtyard, carved statuary and stone stairways leading up to a variety of rooms. Because the ruins of Zinj were to crumble during an earthquake sequence in the film's finale, Michael Lantieri worked closely with Michael Riva in determining how the set could be built to withstand the rigors of filming and still collapse on cue. To facilitate the effects rigging mandated by the finale, the sets were built on platforms approximately ten feet above the stage floor. "Essentially," explained Lantieri, "the sets were built on air bearings and 'floated' above the stage floor so we could shake them to produce the earthquakes. Big jackhammers were tied to the sets and run with pneumatics to shake the entire set. The impact hammers varied in speed and intensity so we could ramp up and down, creating a slow build to the shaking and tremors. We were also able to create the illusion just by shaking the camera; and we built special shakers for that. *I*t's an old trick; but if you do other things to support it, you can still get away with it."

In addition to a general shaking, the earthquake sequence required specific areas of the set to split into giant fissures. "There were three or four points where we needed to show the ground opening up in huge scale," Lantieri said, "so we created tectonic plates in the set that could shift and open. There was one area where the set split to create an opening that was a hundred feet long and about fifty feet wide. These were fissures on a grand scale." To realize the large-scale effects, the sets were built over steel structures pinned together with explosive bolts that could be released on cue. "The pins held everything together securely until we released the bolts. Then, once we let off the explosives, everything fell apart and opened up."

Although Zinj had been lavishly dressed in jungle foliage by greens coordinator Danny Ondrejko, lighting requirements had mandated the set be built without a jungle canopy. Thus, ILM was called upon to add the jungle umbrella to shots that would otherwise have revealed the lighting grid at the ceiling of the stage. Digital matte artist Paul Huston was sent to Guatemala to take hundreds of still photographs of the jungle. Selected images were then scanned into the computer and animated to suggest movement. "We also shot foreground foliage to go in front of the still photography," Farrar said. "The digital matte department added those separate elements as we needed them to create moving vines and shrubbery and so forth."

The scope of the Zinj set was also amplified through a digital matte painting rendered by Huston. “Paul did a beautiful matte painting behind the temple heads to make Zinj look larger in our first wide view of it,” noted computer graphics supervisor Sandra Karpman. “In the shot, the foreground is real and the temple heads are real, but everything behind the heads is a matte painting. *In* reality, there was nothing there but rafters, the ceiling of the stage and the back wall.” Eddie Pasquarello composited the matte painting into the plate, matching a long, sweeping pan that was included in the Zinj reveal.

It is while exploring the ruins of Zinj that the expedition members suffer their first attack from an intelligent and savage fighting force of genetically aberrant gray gorillas. Through the interpretation of hieroglyphs on the ancient walls, the group learns that gorillas were bred and trained by the people of Zinj to guard their diamond mines. Hundreds of years later, descendants of those gorillas – now inbred and mutated – remain to fulfill the centuries-old edict to kill all intruders on sight. The realization of the gray gorillas was a task undertaken by Stan Winston Studio. A total of twelve ‘grays’ were ultimately built – eight fully-articulated hero versions and four with more limited articulation. Ten performers joined with John Alexander, Peter Elliott and a crew of sixteen puppeteers to make up the gray performance team.

The design of the grays evolved through meetings between Stan Winston and Frank Marshall. Unlike the Amy concept, which had to conform, more or less, to the physical characteristics of a mountain gorilla, the design of the grays, a nonexistent breed of primate, was more nebulous. Taking a cue from its aggressive, violent behavior, the filmmakers finally conceived the gray as a hybrid, a cross between the aggressive chimpanzee and the larger, but more gentle-natured, gorilla. “Basically,” laughed Winston, “we determined that the grays were chimporillas – or grimps. The grays resembled chimps both physically and in their behavior. They had the long, barrel-shaped torso of a chimp, and the elongated face. At first there was the idea that the grays should all look alike so that they would be this vicious force of indistinguishable animals. But *I* thought it would be more interesting if each had its own look and character and personality. *It* also provided us with a way of revealing how mutated and diseased these things were. One of them had a closed, oozing eye; another had a withered arm. *I* just let the sculptors go with their imaginations – and *I* think they really enjoyed that.”

Final designs were dependent somewhat on the facial structure of the individual performers portraying each of the twelve grays. “We made casts and positives of the performers,” explained Chris Cowan, who supervised the construction of the grays, “and the sculptors worked from those. Then we had to decide, in each case, how much room there was for mechanization. Thus, the physical structure of each performer would determine, to some extent, the design of that particular gray. Also, specific characteristics of the performer would suggest certain things in the design. As the performer got more and more into rehearsal, we would see what he had to offer the character, and build that in accordingly.”

Similar to the Amy suit, the suits for the grays were made up of a two-piece muscle suit, steel and aluminum arm extensions, and a hair suit made of hand-punched yak hair and silicone skin. “The bottom part of the muscle suit had the leg, gluteus and butt muscles,” Cowan explained, “while the upper part went from the shoulders to the forearms and down to the crotch. The hair suit was also

in two pieces. The pants, with the feet attached, slid on; then the torso section snapped along the upper thigh and under the crotch."

Also similar to Amy was the construction and operation of the head. Fifteen to seventeen radio-controlled servo motors fit inside a carbon fiber underskull, which was covered by the outer skull of the gray. "The underskull was attached to the performer's head with a clamshell-like cinching mechanism," Cowan said. "There was a clip on each side and a tightening mechanism on the back of the underskull. So we could get a very tight seal, with the silicone right up against the performer's skin." The servos inside the skull drove functions such as nostril and lip articulation, while a telemetry device worn by a puppeteer controlled the open and close of the jaws.

Unlike Amy, the grays did not require eye mechanisms, as the design of the head was such that it allowed for the performers' own eyes to be revealed. Twenty-two-millimeter scleral contact lenses devised by Dr. Jonathan Gording were worn by the performers to simulate the shape and darker coloring of a gorilla's eyes. Without the need for eye articulation, each gray required only two puppeteers – one to control the nose, cheek and brow movement, and another to control the lip articulation via joystick and the jaw movement through telemetry. "On three or four of the heads," Cowan explained, "there was also a chin cup that enabled the actor to drive the jaw independently. There was a switch on the remote control box that allowed us to transfer from the telemetry unit to the actor-driven jaw mechanism. The reason we had that on some heads and not on others was because of the different sizes and shapes of the sculptures. On some of them, there just wasn't room for one more mechanism." In addition to the two puppeteers, each gray required its own dresser who was responsible for cosmetic maintenance, as well as getting the performer in and out of the suit as needed.

No puppeteers were required for the four background grays, whose construction was headed up by Paul Mejias. Not featured in closeups, the background grays were equipped only with a jaw device – operated from within the suit – which was similar to that employed by Chewbacca in the *Star Wars* films. "Like Chewbacca," Cowan said, "the background grays had a mechanism so that when the actor opened his jaw, the gray jaw would open, pulling back the lips in a kind of snarl."

Eight fully-articulated hero grays and four less complex background versions – equipped only with a performer-driven jaw mechanism – were ultimately constructed for the production.

For the initial attack on the expedition, Michael Lantieri provided physical effects that heightened the illusion of the gray's power and strength. "In the attack sequences," Lantieri explained, "there were times when the grays had to knock something down or carry somebody; and we were involved in making that happen. We did a lot of rigging from overhead, using cables to help the gorillas – who were simply men in suits – to carry bodies or pick up boulders. It was a matter of selling their strength and making it appear as if it was effortless for them. All of those gags were figured out beforehand; and once we were on the set, we worked very closely with the puppeteers and the actors so the timing was right."

A band of grays confronts the explorers within the fabled diamond mines surrounding the city of Zinj. The enormous mine set was constructed on a soundstage at Sony Studios.

After holding off the grays – and with Mukenko threatening to erupt – the group attempts an escape and, in the process, stumbles upon the legendary mines of Zinj. "The mine set was really large," Sandra Karpman observed, "but for a big pullback and reveal when the characters first walk in, we had Yusei Uesugi do a digital matte painting. Because we were pulling back on the painting while the live-action camera was still panning, there was lens distortion that we had to match. In our digital compositing department, Don Butler manipulated the matte painting so that it would match the lens distortion as the camera panned."

Also built – on another stage – was an even larger set representing the entrance to the ruins and an adjacent courtyard. A sweeping reveal of the city and its environs as the explorers approach was expanded in scope with a digital matte painting rendered at Industrial Light & Magic by Paul Huston.

Continuing their exploration, the expedition members find an enormous, room-size geode whose diamond-encrusted ceiling is the mother source of the mines. Like the main Zinj set, the geode room – on Stage 30 adjacent to the mine set – was built to accommodate earthquake and volcanic effects. "The room had an eighty-foot-long by thirty-foot-wide wall that was hydraulically controlled to crack and fall," Lantieri explained. "It also had an arched entrance that was rigged to collapse." Also on Stage 30 was the pavilion, an area of Zinj that was built apart from the principal set due to space considerations. "The pavilion had a huge sinkhole that characters fall through, dropping twelve feet down into water below. All of that had to be rigged and set to collapse as well."

While the interior of the geode room was built full-size on the stage – carved out of foam and then painted – its diamond ceiling was left to the miniature crew at ILM. "The art department's first idea had been to do some kind of vacuformed practical ceiling," model shop supervisor Lorne Peterson explained, "but it quickly became evident that trying to use real crystals at that scale would have been too expensive – and crystals replicated in some kind of polyester would not have had the same

clarity or look. The obvious decision was to do it as a miniature. So we built a model that was about five feet across and made partly out of foam and partly out of industrial-strength aluminum foil crinkled and painted black to look like rock." Real crystals ordered from a mine in South Carolina were positioned inside the model by chief modelmaker Barbara Affonso. "Most of the crystals were quite small – under an inch long and about a quarter-inch wide. In addition to using the real crystals, Barbara made some vacuform plastic crystals. She went to crafts and notions stores and got every shiny doodad she could find to put in there." A real crystal was also used for the giant diamond discovered in the geode ceiling. "Barbara found a crystal that was four inches in diameter and five inches long. Compared to the little crystals around it, it looked really huge. The real trick to making this miniature work was the lighting – lighting was crucial in making this ceiling look spectacular." To provide additional sparkle and shine to the ceiling shots, Pat Turner shot crystals on black velvet so that the resulting sparkle elements could be composited as needed with the model photography.

From the honeycombed walls of the mines, dozens of grays emerge to stage their final attack. Because only twelve grays had been constructed, ILM shot a number of passes on groups of grays positioned in various locations on the set, then combined those passes to make it appear as if the mines were more heavily populated. "We would photograph the gray actors in a particular spot," Farrar explained, "then move them to another spot in the set and photograph them again. By layering all those passes, we wound up replicating their numbers considerably. Because the shots were fairly simple, we didn't have to shoot the separate passes motion control. We just shot them with the camera locked off, and then added whatever pan or tilt moves we wanted in post."

As the expedition survivors fight off the grays, hell breaks loose with the violent eruption of Mount Mukenko. Working with plates filmed at the active volcano in Costa Rica and on the specially rigged sets, ILM realized the climactic sequence using a variety of techniques to create smoke, lava and earthquake simulations. The lava effects – which included shots of lava sweeping down the mountain's slopes and through the mines and ruins of Zinj – were particularly problematic and required months of development and experimentation.

Early in production, Frank Marshall had considered attempting some of the lava flows practically on the set. To that end, Michael Lantieri, foreman Tom Pahk and the special effects crew went through an intense period during which they tested the feasibility of pouring full-scale lava. "There were some interesting experiments," recalled Lorne Peterson. "The idea was that they were going to flood the stage with some kind of methocel mixture and get lava actually going through the set. They proposed filling two ten-by-eight-foot tanks with this stuff; but the stages were so enormous that even that amount of lava would not have been substantial enough. Eventually it became evident that any kind of full-size pour would have been a huge mess."

Turning away from a practical approach, Marshall and Farrar determined that the lava effects could be achieved in miniature. Working in more manageable one- to three-gallon quantities, the ILM crew tested a variety of substances, including flour and water, Karo syrup, driller's mud and marshmallow sauce. "The mandate was to try to find something even better than methocel," Peterson commented. "But *I* remember chief modelmaker Howie Weed saying, 'You know, when all of this is done, you're going to end up using methocel.' And he was right. But we had to go through

those stages, just to be sure." Ultimately, the methocel was mixed with tiny styrofoam beads to give the mixture appropriate viscosity.

In addition to replicating the look of molten lava, the effects team had to simulate its black surface crust. Black tempera pigments were combined with polysorb to produce the effect. "Polysorb absorbs many times its own volume in water," Peterson explained, "and it is used in plant nurseries and in soaking up chemical spills. When we sprinkled it on the methocel, the polysorb would begin to grow, almost like miniature brain coral. *It* would rise up, forming a separate mass on the surface of the methocel and breaking up into separate platelets – just like real lava crust."

Visual effects supervisor Scott Farrar confers with one of the gray performers during a bluescreen shoot at ILM.

To achieve the proper interaction of crust and flowing lava, the polysorb mixture was applied to a thin layer of methocel which sat in a four-by-eight-foot plywood 'cookie sheet' used in place of a traditional dump tank. "Instead of the few square inches of crust we might have had if we were pouring from a cup-shaped dump tank, on the cookie sheet we had almost as much crust as there was lava underneath. That way, when we poured it, the crust stayed with the lava. After some experimentation, we discovered that we needed some oil on the top of the methocel to make the crust slip and slide at a different rate than the lava underneath. So we sprayed PAM on the surface of the liquid to make it slippery and create a differential between the lava surface and the crust surface." Having determined the appropriate materials to replicate lava, ILM produced a videotaped test of the substance being poured through a seven-inch-wide trough rigged with balloons underneath that would push the material up in different areas to suggest the roiling movement of lava. Once Marshall viewed the test, any lingering thoughts of producing the lava pours in full-scale were immediately dismissed.

Most of the film's visual effects were concentrated in the finale, an extended sequence that incorporated a volcanic eruption and attendant earthquakes that rock the region and tumble the ancient ruins. While Michael Lantieri's special effects crew rigged the stage sets for closeups of actors on shaking ground, the ILM team employed model photography to provide dramatic wide views. A sixth-scale Zinj model was constructed in segments and rigged with hydraulics to make individual sections rise and split apart leaving gaping fissures.

The specific methodology proposed by Farrar and the visual effects team was to pour the methocel lava substance onto miniature sets that matched exactly the geometry of the full-scale sets at specific camera angles. Those sets would be painted blue to allow for easy extraction of just the lava imagery, which would then be matted into clean plates of the live-action sets. To further facilitate

the matting process – and to create a realistic, self-illuminated look – the simulated lava would be poured white, then colored a glowing red in the computer after the fact.

"We began by photographing the full-scale sets and measuring them precisely from every possible angle," explained Peterson. "Then we built one-sixth-scale models to represent exactly what you would see on the set from that specific camera angle. So it was not a matter of building one model that was an exact copy of the entire set; instead, we built one model to represent the set from this camera angle, another model to represent the set from that camera angle, et cetera. At one point, we did consider building a huge Zinj set that was sixty feet by eighty feet – but a large model for one wide view would not have been as interesting. Frank Marshall wanted his characters in peril, with close shots of them interacting with the lava."

Twelve of the sets were carved out of urethane foam, then treated with a hard urethane coating to make them waterproof. "We used a rim-shield machine," Peterson stated. "Instead of spraying paint on a model, it sprays a hard urethane coating which not only makes the model waterproof, it also strengthens it. It allowed us to do our pours and then clean the models off easily with hoses and warm water." Mechanical supervisor Dave Heron rigged the miniatures with bladders and ten-inch diameter pistons to make the lava flow in a roiling, bubbling fashion. The final step was a flat Ultimatte-blue paint job.

Early on, the team had intended to paint the sets black – reasoning that black would create the best contrast against the white lava, thereby resulting in the most easily obtainable mattes. The decision to go with blue, however, was made so that the computer could distinguish between the set and the black crust. The choice was further validated when Sandra Karpman did color separations of real lava photography and discovered that it contained no blue at all. Thus, extraction of the white lava from the background, and its subsequent coloring in the computer, was considerably simplified.

"At first *I* was wary of the idea of shooting the lava white and then coloring it in digital," said Karpman, "because *I* thought that extracting white from a set would be really hard. But the white ended up being the easiest for us to color; it was also the easiest color for the crew on stage to light. They had done some tests with red lava and had to light it much more brightly because red is not as reflective as white. So white was the best for them; and it turned out to be the best for us as well." The glowing red color was achieved by applying an algorithmic formula to the lava during the compositing stage.

The eruption begins with a wide view of Mukenko as the mountaintop implodes, followed by shots of ash and lava spewing upwards. To begin designing the effect, Farrar and the ILM team relied on documentary reference footage to aid them in recreating the progression and behavior of an actual volcanic eruption. "What really happens during an eruption," Peterson noted, "is that the mantle starts to press up under the earth, like an aneurysm in your body. It actually pushes the earth up first, causing a swelling and cracking of the ground. Then ground water runs down into the cracks, hits the mantle, and produces an explosion of steam and smoke. All of that gray stuff floating in the air after an eruption is actually steam and powdered rock. *It* has a very specific, roiling look to it; and that was the look we had to replicate."

For the initial implosion, John Goodson and John Foreman built a large, bluescreen-blue mountain miniature, twelve feet across, with a four-by-two-foot cavity at the top to represent the implosion

area. The cavity was covered with gray and black microballoons – used as filler in plastics – which, when mixed with alcohol, created a dry, earth-like clay. Two large balloons were situated beneath the cavity to simulate the action of the earth's mantle during an actual eruption. "From below," explained Peterson, "the balloons were pushed up slightly to make the clay on the top rise and crack. The model also had a device to puncture the balloons, which would cause the whole thing to collapse, simulating an implosion. The cavity itself was filled with loose dust and debris. As soon as the balloons were punctured and the implosion occurred, dust and debris were blown up into the air by venturis." The imploding miniature footage was composited with a live plate of Mount Arenal – the top third of Mukenko represented by the miniature and the bottom two-thirds by the real mountain.

Following the implosion is a wide shot of lava spewing out from the mouth of the volcano. The burst was created on another mountain model with a technique dubbed 'Like Water for Lava' by the model photography crew. "By looking at a lot of footage of lava," Peterson commented, "it occurred to us that it looked very much like water spewing out of a water hose. So we started to do some experiments with a hose, just manipulating the water stream with our fingers. Jokingly, we referred to it as 'digitally manipulated water' – but just by using our fingers, we were able to get a lot of different looks to the stream." Eventually, the model shop's Michael Lynch devised a sophisticated, controllable venturi system to manipulate a stream of water and create the lava burst.

The main mountain model – painted black – was approximately twenty-five feet across and six feet tall. "We covered it with eighth-inch screen and flocked it to create the right texture," Peterson stated. "Because it was only going to be seen from one side, we built only the front half; so on the back side, there was enough room for two or three people to sit and manipulate four hoses coming out the top. That worked very well. Water spewed out from the top about four or five feet and then fell back down onto the mountain. Because the model was made of screen material, however, the water did not run down in little rivers like it would have otherwise. *If* it had, it would have looked like water, not lava. A drop of water will decrease in volume as it runs down a surface, while lava is self-replenishing – it actually increases in volume as it flows. To recreate that look, we wanted to see the effect of the water hitting the mountain surface, but without seeing that drop of water run down the side. So we made the model out of this flocked screen, which made the water drop through the mountain." To simulate the thicker viscosity and mass of lava, the water plume was shot at 300 frames per second – considerably faster than the 90 frames per second at which the methocel lava was filmed. As with the methocel, however, the water was isolated in the digital department and tinted an orange-red color.

Following the explosion, massive clouds of smoke form over the mountain. From his study of documentary material, Farrar knew that the smoke produced from a volcanic eruption had a unique look and texture. “In the footage of Mount St. Helens we saw that the volcanic smoke plume was very heavy, tufted and complex. There was a volume and solidity to it that was similar to cloud tank material, but not exactly the same. *I* was not inclined to use cloud tank footage, because *I* think audiences are very familiar with it now and they know what it looks like. *I* just didn’t feel it would be right for this.”

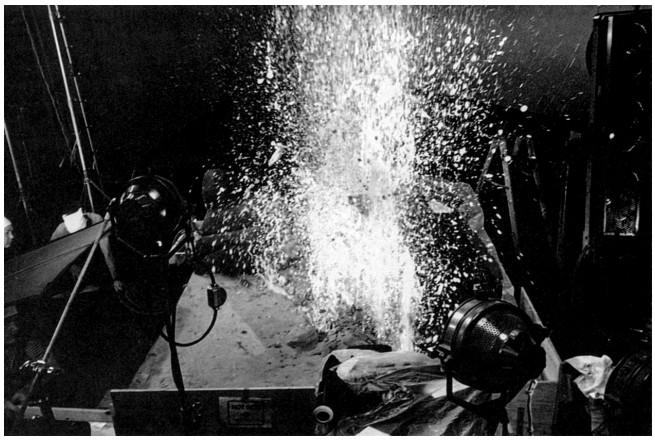
Rejecting the cloud tank approach, Farrar turned the smoke plume effect over to the computer graphics department. “The hardest part of devising a CG smoke effect was deciding on a technique,” Sandra Karpman commented. “For a while, we considered using Dynamation – a 3-D animation software that can do pyro bursts – but *I* was afraid it would not hold up for what this smoke needed to do. This smoke had to look huge and roiling and threatening. *I* remember watching reference footage of actual ash plumes with Mark Dippé and Scott Farrar, and you could just see the geometry in it. So we agreed to go with actual computer models – animated in Softimage and rendered using RenderMan – then achieve the smoke look with shaders.” Once the technique had been agreed upon, technical director Dennis Turner built three-dimensional models to represent the mass of the smoke plume, then animated them to rise from the mountain and move within the frame. Although the smoke shader did not have to be written from scratch, an existing program did have to be modified. “The smoke shaders needed complete manipulation,” Karpman recalled, “so Dennis created shaders that allowed us to see more and more detail the closer we got to the smoke. He came up with all the formulas and made it work. *It* was very exciting. *In* CG, duplicating natural phenomena is always a challenge – so doing smoke was a really big deal.”

Lava effects were also realized in miniature. To replicate lava flows, a white methocel mixture – topped with a crust of poly sorb and black tempera pigments – was poured from a flat dump tank. The pour was then tinted a hot, glowing red in digital postproduction. Model shop supervisor Lorne Peterson conducts an early pour test.

Modelmaker Tony Sommers constructs a section of the Zinj model used for the lava flow sequence. The carved

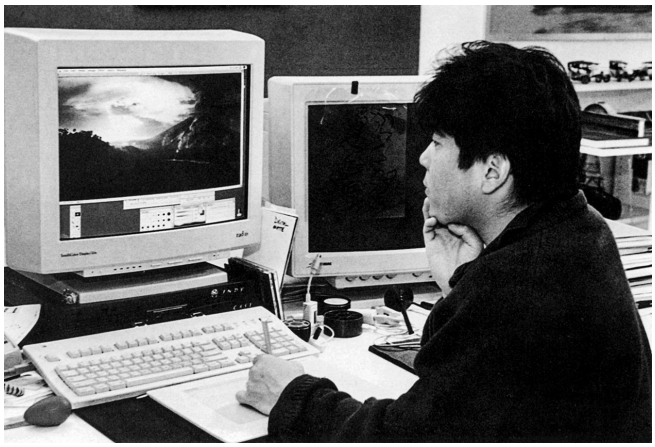
As Mukenko erupts, molten lava bursts forth from the walls of the mines where surviving grays and members of the expedition are still engaged in battle. One of the first shots in the sequence revealed the earth opening up as lava burst into the mines. “Frank wanted it to look like a scene in *Fantasia*,” Peterson noted, “where lava is flying up in the air in a very dramatic fashion. *It* wasn’t necessarily a realistic representation of what lava would do, being downstream from the caldera, but it was the kind of dramatic effect Frank wanted there. Charlie Bailey and Tony Sommers built a model for the first shot. The front part of it was naturalistic and exactly matched that section of the mine set; the back part of it was blue. Again, we created a kind of earthen bridge using microballoons and alcohol to form a clay. Then we put pressure devices underneath to inject air and create a kind of fissure in the earth. So you see the earth opening up on the natural part of the model; then the lava bursts forth and falls onto the blue part of the model. When that was extracted and matted into the background plates, it looked as if the lava was falling onto the live-action set, very near to where the characters were standing.” All together, four models were built to represent various areas of the mine being engulfed in lava. To provide interactive lighting from the lava during the live-action shoot, Michael Lantieri’s crew had provided a light-snake – a long cord strung with halogen lights that was pulled through the set to create an appropriate glow on the actors and their surroundings. *In* postproduction, the ILM digital department made that glow a lava-like red.

foam model was dressed with individual miniature bricks and trees that diminished in size to force the perspective. Models were constructed representing areas of the stage sets as seen from specific camera angles. The methocel mixture was photographed flowing through the models, then extracted digitally and composited into live-action plates. Effects cameraman John Fante prepares for a shot.



Models representing the volcano were constructed for eruption shots. Establishing views of an ascending ash plume were achieved using a mountain model rigged with venturi tubes to blow dust and debris into the air. Resulting film elements were composited into plate photography of an active volcano in Costa Rica. Subsequent shots of roiling smoke were produced with computer graphics and smoke shaders. Another model was built for scenes of lava spewing from the volcano. Water was pumped out of the top through hoses, then photographed highspeed and colored digitally.

As the characters climb up rocks to escape the rising lava, grays emerge from the steaming mine walls, instantly disintegrating as they come into contact with the molten mass. “They had to look as if they were bursting into some kind of explosive, quick flame as they dropped into lava pools below,” Farrar stated. “It had to happen very quickly because, realistically, if you came in contact with lava, you would vaporize instantly. For that reason, we didn’t need a lot of interactive stuff; we just needed elements of them blowing up.” Stunt gray performers were shot leaping from various levels of the mine set onto stunt pads. “Their hit points in the lava were higher than where the stunt pads were, so we had to make them vaporize before they hit. Then we just needed a little reactive effect of them hitting the lava itself – like a very tiny splash or ash element.”



Matte artist Yusei Uesugi incorporates moving smoke and lava into a wide shot of the volcano – the top of which was produced via visual effects and matted onto the actual volcano filmed in Costa Rica.

Miniature gray figures made of pyrotechnic elements and steel wool were fashioned for the sequence. “Steel wool burns in such a way that none of the flames are more than an eighth-of-an-inch tall,” Farrar explained, “so the scale was right. These little forms were shaped to copy the stunt performers in the live-action plates we had shot – the body positions they were in at the point they were supposedly hit by lava.” A traditional burn suit was also photographed for one shot. Other quick cuts employed full-size gray dummies provided by the special effects department.

Attendant to the eruption is a massive earthquake that rocks the region and brings down the ruins of Zinj. Although closeup shots had been achieved on the collapsible stage sets, the sequence still required further enhancement by ILM. One series of shots was to show characters being lifted many feet into the air as the ground beneath them rises suddenly. Employed were both the stage rig built by Lantieri and a miniature produced at the effects facility.

Howie Weed worked out the required movements by first making a miniature version of the model that would be built. After putting the miniature through its paces and videotaping the results, Weed sent the tape to Los Angeles for approvals from Scott Farrar and Frank Marshall. Taking their reactions and comments into account, Weed then commenced building the elaborate Zinj model, a thirty-by-forty-foot, one-sixth-scale replica of the massive ball court area patterned after the live-action set. “To give the model as much scope as Frank Marshall wanted,” Lorne Peterson said, “there were painted backdrops in the rear, along with reduced-scale structures. We also forced the perspective on some of the trees. *In* the foreground, we had trees that were six or seven inches in diameter; then way in the background, near the paintings, we had trees that were only two or three inches in diameter. This model was an exact duplicate of the set, with all the little buildings and stairways made from individual tiny bricks.” Like the other miniatures built for the movie, this one was carved out of foam and sprayed with hard urethane.

Dave Heron was responsible for the mechanical rigging. “The center of the ball court rises up,” Peterson explained, “causing all of the surrounding buildings to collapse. Dave and his crew built a very sophisticated steel channel section underneath the model that was also about thirty feet by fifty feet. Down the center was one big steel bar that could rotate and also lift sections of the model. On top of that were attached hydraulic pistons that would move up and down and split the surface of the model. *If* you saw it from above, it would look like a jigsaw puzzle with all of these broken-up sections, each about the size of a desk.”

Scaled replicas of the plants used on the live-action set were employed to dress the model and hide seams between the separate sections. “Our greens crew, Randy Ottenberg and Geoff Lake, went out and researched plants that looked like one-sixth-scale versions of the full-scale trees. Then they arranged to get truckloads of these plants from nurseries all over. Michael Cummins manufactured some vines.” Synthetic trees were also constructed to sell the authenticity of the quake. “When we had the big earthquake up here in 1989, *I* remembered running out in the parking lot and seeing really big trees flapping back and forth. To duplicate that, we made fifteen-foot-tall trees with a very flexible pipe on the inside. For each shot, someone would be up in the ceiling with a rope to make these trees sway back and forth.”

Final enhancements were achieved in ILM’s digital department. Camera shake was added to increase the effectiveness of the tremors; and heat ripples rising off the lava were included in some shots. Also added were ash and smoke elements photographed practically by John Fante. “*I* don’t think there were any two-element comps on this show,” Sandra Karpman commented. “They were all outrageous. Any one shot would have ash and smoke elements, heat ripples, camera shake, fire elements, lava, model photography. Some of the shots had as many as thirty to fifty elements in them; and all of those elements had to be layered so they wouldn’t look as if they were all just added to the top. We put layers behind layers to make it look right.”

Ultimately, the destruction sequence embodied nearly every effects technique imaginable. “The interesting thing about *Congo*,” noted Ned Gorman, “was that it was a real fusion of all the things we’ve been developing over the past fifteen to twenty years. We couldn’t have done the lava effects without access to all of the new and traditional technologies, especially considering the schedule we were on. Some of these composites, which had so many elements, would have taken months to do optically.” *In* addition to showcasing effects craftsmanship, the eruption of Mount Mukenko provided a spectacular finale to the film. “When we showed our first lava shot to the company at ILM – a shot that had something like forty-eight elements, and showed lava cascading down steps behind a couple of actors – it got applause. *It* even impressed the hard cases at ILM. We felt as if we met the challenge we had set down for ourselves. We wanted to create effects that were so spectacular that people could look at them twenty years from now and say, ‘Nobody’s ever done volcano effects any better than *Congo*.’”

Free of the erupting volcano – and reluctantly leaving Amy with the gorilla community she has joined – the survivors at last make their way to the wreckage of a downed TraviCom plane where they find, stowed inside, the hot air balloon that will carry them to safety. Dialogue scenes between the characters were shot by hanging a camera and the balloon gondola on opposed hundred-foot Chapman cranes. Subsequent wide shots of the balloon passing by the erupting volcano combined

visual effects with footage of an actual balloon moving across Mount Arenal. “The Costa Rica plate showed the balloon lifting off and passing in front of the sun during a sunrise,” Farrar said, “which worked for us as a sunset. *In* the background, we had to put in Mukenko with all the smoke coming out and lava rivulets running down the sides. Production shot the balloon and we just plugged in the mountain with a digital matte painting. To add movement, Yusei Uesugi placed moving smoke, fire and lava flows into the painting.”

In *Congo*, effects had been realized that were noteworthy even in the context of the impressive careers of its principal providers. Michael Lantieri had achieved demanding, large-scale effects that put the ‘action’ into an action-adventure film. Stan Winston and his artisans had created animal characters that were authentic, dramatically compelling and virtually alive. And ILM had provided the crucial elements to make Zinj and its volcanic environs a spectacular and unquestionable reality. The well-honed effects expertise exhibited by these professionals was also in evidence at the very top of the *Congo* chain of command. “Frank Marshall and Kathy Kennedy are really old hands at ILM,” Ned Gorman commented, “so they know all the ins and outs of visual effects. Frank knows how effects shots are going to integrate; he can look at a storyboard and figure it out. We could actually show him a shot in progress and not be terrified that he was going to say, ‘Jeez, is that how it’s going to look?’ That was a liberating experience for us.”

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DREDD WORLD

image

article by
Mark Cotta Vaz

In the grim world of Judge Dredd – a futuristic thriller based on the popular British comic book series – one of the few enclaves of civilization to have survived massive ecological disaster is Mega-City One. Isolated and overpopulated, the city – at street level – has become a center of urban violence policed by an elite order of stern and relentless Judges. Sylvester Stallone stars in the title role.

The international production was based at Shepperton Studios, outside London, where the grimy streets and lower levels of Mega-City were erected as backlot sets by production designer Nigel Phelps.

Once the future was envisioned as a technological utopia where robot slaves performed most work, each home had its own private helicopter pad, and cities gleamed invitingly to a smiling citizenry. *In* the last twenty-five years, however, future visions have grown darker, generally offering up some nuclear conflagration to scour the land and leave only a few survivors locked into primal struggles over the detritus of the old world.

Helming the picture was director Danny Cannon.

Judge Dredd a British comic book series launched in 1977 in the second issue of 2000 A.D. comics, has all the requisite trappings of an apocalyptic future. The setting is the 22nd century where an ecological disaster has devastated the planet, leaving vast expanses of toxic wasteland. *In* America, three regions have rebuilt, with the Eastern seaboard sprawl known as Mega-City One still offering glimpses of that utopian dream of ease and super-technology and the privileged few enjoying their robot slaves, flying vehicles and fabulous wealth. The flip side is that the rest of Mega-City – with its population of 800 million – has tens of thousands of inhabitants living in massive apartment blocks, unemployment rates in the ninety-percent range, and a steady drumbeat of crime and disasters punctuated by flashes of mass violence. To maintain order, the mega-metropolis is patrolled by the Judges, an elite order that is part supercop, part Roman legion. The most famed – and feared – of them all is *Judge Dredd*, a character created by the British team of John Wagner and Alan Grant as the ultimate avatar of law and order. *Judge Dredd*, a summer Cinergi Pictures release distributed by the Disney organization, was an international production that ranged from Shepperton Studios in London to a high-tech visual effects facility in rural Massachusetts. Mega-City One, at street level, would be erected as a huge set on the Shepperton backlot. *Its* upper levels would be supplied by Cinergi F/X, where breakthroughs in miniature photography would produce a number of complex sequences incorporating greenscreen live-action elements, model buildings and computer generated imagery. Heading up the Dredd team would be Joel Hynek, a visual effects supervisor who, along with other key artists on the production, had experience both in features and the ride-film medium.

Although backed by an American studio, *Judge Dredd* would boast a roster of top British talent, including director Danny Cannon, production designer Nigel Phelps, special effects supervisor Joss Williams, makeup and prosthetics designer Nick Dudman and construction coordinator Michael Redding.

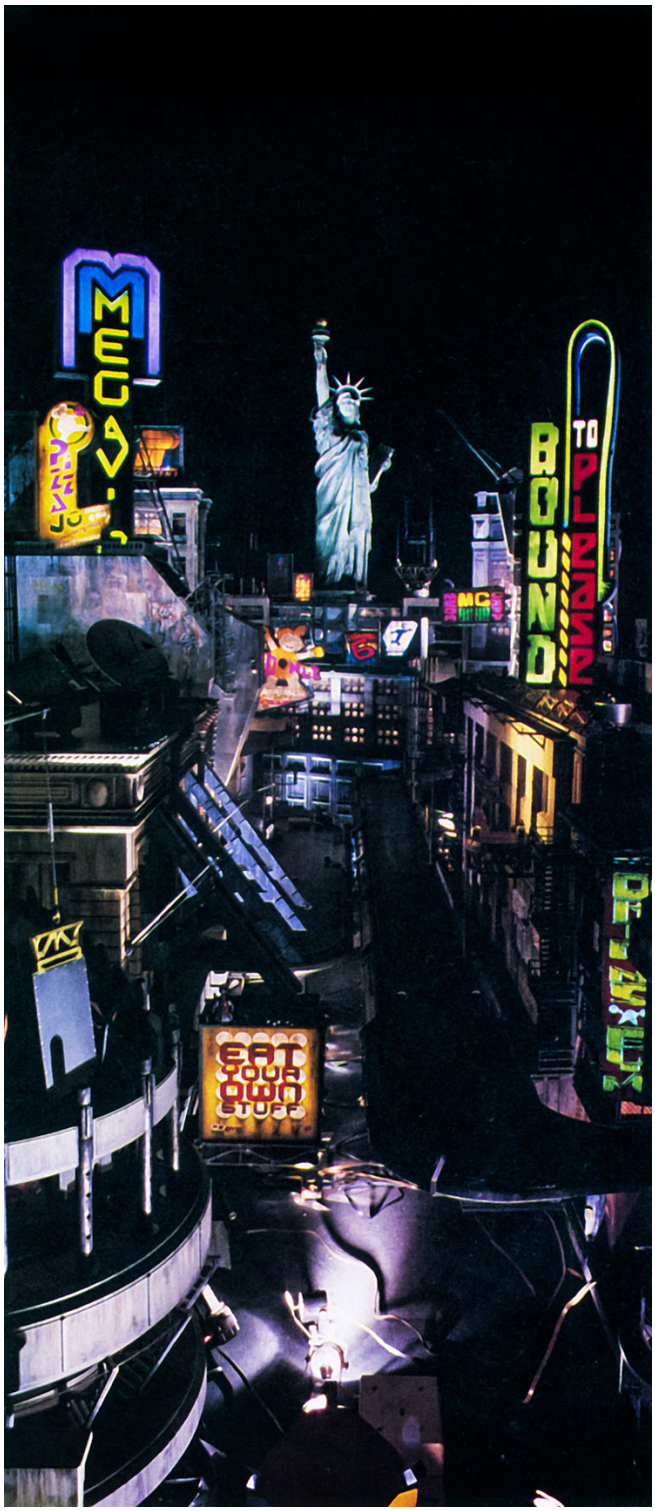
A number of factors were responsible for getting the production rolling, including the signing of international action star Sylvester Stallone to pull on the boots and wear the helmet of the title character. The property had been in the hands of Andy Vajna, a founder of Carolco who had sold his interest in that company to found Cinergi Pictures in 1989. The Cinergi team was unhappy with a commissioned *Judge Dredd* script until Danny Cannon - who had only one feature to his credit, the 1993 English thriller *The Young Americans* – brought to it his own personal enthusiasm. "When *I* met with the producers, *I* told them, '*I* don't want to hate this movie, whether *I* direct it or not,'" Cannon said. "I'd been reading Dredd since 1978; and one of the things *I* liked about it was that it had an earnest conviction and sensibility. *It* reminded me of old epic movies – and *I* thought it should have that same kind of epic proportion." Cannon was hired not only to rewrite the script with Gary Goldman, but also to helm the project.

Key to the film was Mega-City One, the two-tiered environment in which much of the story takes place. To develop the design and effects approach to Mega-City, a creative think-tank comprised of Cannon, Phelps and a team of conceptual artists was set up in an office in Santa Monica. The six-month preproduction phase that followed started with the assumption that Dredd's world would have to be created on backlots, soundstages and through visual effects. The result of the Santa Monica sessions was a production design bible which illustrated not only the visual dynamics of Mega-City One, but incorporated into its design the social dynamics of the culture. As finally conceived, the upward thrust of Mega-City reflects the levels of social strata: the gritty, claustrophobic street and mid-level buildings left over from 20th-century Manhattan, where the poor now live and armored vehicles clog the roadways, up to the glittering city heights where the rich reside and aerial vehicles fly about freely.

The overall design favored by Cannon and company was one that avoided the cartoonish looks of other comics movie cities such as the expressionistic, gothic Gotham of the *Batman* films and the garish, Sunday funnies colors of the *Dick Tracy* sets. "From the start, Danny wanted to make this a believable world," observed Phelps, who had helped create the look of Gotham City for *Batman*. "We kept certain elements of the comic book, thinking in terms of a medieval city that is walled and built up. At ground level, there were recognizable aspects of New York that had been built over, and another layer of robotic engineering on the buildings. So New York is still there; but there's new technology, new architecture on top of it. The buildings represent a progression of time." Phelps' department came up with some four hundred drawings and maquettes illustrating the division of Mega-City into three distinct areas: a midtown area for the staging of the Block Wars, flashpoints for the collective angst of those dwelling at ground level; a redlight district on the upper East Side; and the Statue of Liberty, which has been relocated to a downtown Wall Street area.

The construction of Mega-City One began even as the cobblestone streets and old stone walls of Mary Shelley's *Frankenstein* were being struck from the Shepperton lot. Construction coordinator Michael Redding, who had overseen the *Frankenstein* set building, had a crew of two hundred at the

peak of the twenty-six weeks it took to re-cover the backlot with a sprawling futuristic megalopolis. The logistics of building the set were much like building a real city. *Included* in it were buttresses to indicate an overhead roadway, real road surfaces, curbs, giant rams slanting across streets to hold up crumbling edifices, and a base for the relocated Statue of Liberty, the head of which was realized full-size on a soundstage, while a scaled full-length model was produced for miniature photography. The backlot also allowed for a section of the Mega-City wall, the only barrier between the city and the horrors of the *Cursed Earth*, the toxic wasteland beyond the city gates. “We built a forty-foot-high and eighty-foot-long section of the wall, using the back of the scaffolding that held Mega-City,” said Redding. “Later on, the remainder of the wall was digitally added to make it extend many hundreds of feet.”

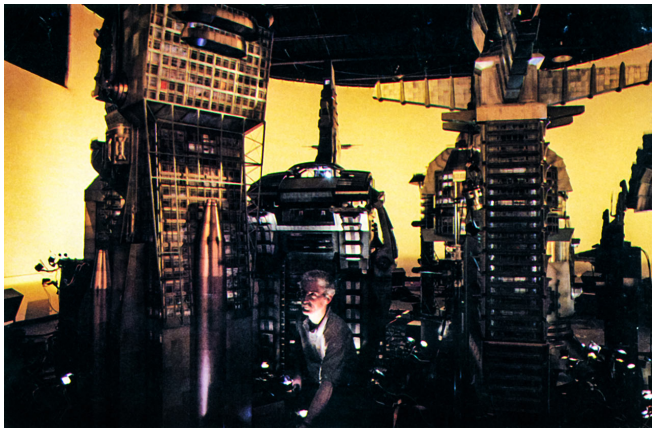


Complementing the full-scale sets were models designed and built by Mass.Illusion to realize the various boroughs of Mega-City. As conceived, the sprawling urban center incorporated recognizable elements of 20th-century New York and was divided into three distinct sections, including a neon-lit downtown Wall Street area which is home to the relocated Statue of Liberty.

Although most of the Mega-City action would be staged on the Shepperton backlot sets, the city's rarefied upper levels would be conveyed with visual effects produced at the Cinergi F/X facility, located outside the little town of Lenox in the Berkshire Hills region of western Massachusetts. The Berkshire region, with its rolling, forested hills and colonial-style houses seemed an isolated and unlikely spot for a high-tech filmmaking enterprise. But it was here that effects visionary Douglas Trumbull had produced groundbreaking ride-films such as *Back to the Future* for the Universal Studios tour and *Secrets of the Luxor Pyramid* for the Las Vegas Luxor Hotel, working out of facilities outfitted with the latest in high-tech filmmaking equipment and a staff of experienced visual effects artists. After completing the Luxor project, Trumbull withdrew from the building he had outfitted to make it; and Circus Circus Enterprises-which owned the physical plant – in turn sold it, equipment and all, to Cinergi.

Like its predecessor, Cinergi F/X would have an art department, a model shop, a digital compositing suite, an area for in-house computer graphics vendor Kleiser-Walczak Construction Company, three motion control stages – including an enormous gantry stage – and a special previsualization department that had been used to tie together the computer graphics and model photography on the Luxor project. Although the complex had been purchased with only *Judge Dredd* in mind, Cinergi would be so pleased with the work produced there that it would later opt to maintain the site as a permanent effects facility, rechristening it 'Mass.Illusion.' "We were fortunate to assemble a group of the best technical and creative talent in the industry to create the visual effects for *Judge Dredd*," commented effects producer Diane Pearlman. "At least ninety percent of us had worked together on other projects – either on commercials, features or specialty venue attractions. We knew the studio and we knew each other; and that allowed us to push the limits of what we could create together."

Other parts of the city – including the lower street levels infested by crime – were also constructed in miniature.



Wealthy citizens reside safely above the squalor in lavish upper-level penthouses built atop the ancient edifices of old Manhattan.

A composite shot of the Hall of Justice – headquarters of the Judges – surrounded by flying vehicles. As with other Mega-City vistas, the buildings employed were miniatures

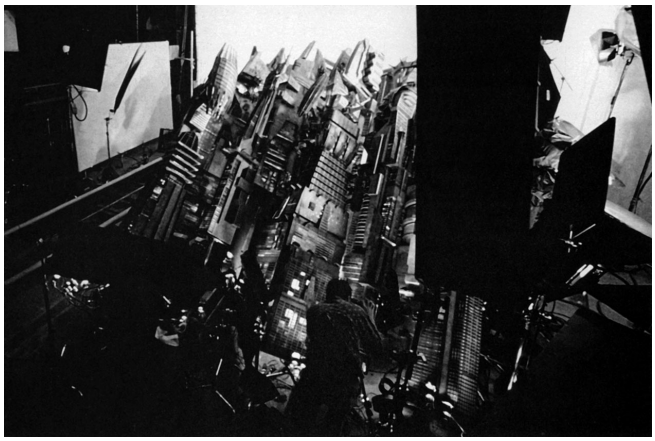
while the vehicles were computer generated artifacts created by Kleiser-Walczak Construction Company.

For Cinergi, one of the advantages of the site was that many of the creative personnel who had served under Trumbull – including visual effects supervisor Joel Hynek – were on hand and available for *Judge Dredd*. And the tools and techniques of the ride-film medium perfectly complemented Dredd's narrative demands. "You discover and learn specific things when you work on a ride-film," observed visual effects art director *Robert* Taylor, another veteran of the Trumbull organization. "For instance, we discovered that the scariest move you could make in a ride-film is to go along at ground level and then have the ground suddenly drop out from under you. *I*t's a visceral reaction, not something you can figure out mathematically. Even though *Judge Dredd* was a normal movie, the kinds of things we learned in ride-films translated directly into it."

Charged with taking the city to its Olympian heights, the effects team began by designing the variety of models that would be required. To orient themselves, Taylor and his art department used an East Coast map to plot out the borders of Mega-City One, which sprawled from Manhattan – where most of the action of the film would transpire – north to upstate New York and west into New Jersey, which bordered on the toxic wasteland of the Cursed Earth. *Instead* of a uniform architectural style, the collection of buildings would emulate the layered look of a metropolis centuries in the making.

A battle between Dredd and Rico – a renegade Judge – takes place at the relocated Statue of Liberty, which has fallen into disrepair. Though the head would be built as a full-size set for live-action filming, wider shots would employ a miniature replica fabricated at Mass.Illusion.

Mass.Illusion's previsualization capabilities were key to understanding the director's vision, and a vital first step in the model design and building process. "It's helpful to previsualize in the computer so you don't waste a lot of time on a model set," Joel Hynek observed. "Ten years ago, it would have been done with storyboards or foam-core mockups for video tests. Pre-viz can be used in many ways, such as exploring a concept by creating a rough semblance of the shot. *I*t was particularly handy in our situation because we were in Lenox, the director was in London, and the executive producer was in Los Angeles. With previsualization we could put a whole sequence together as a cut, which was an excellent form for getting feedback." Artistic renderings and blueprints from London and Lenox were the basis for three-dimensional computer generated mockups. Preliminary elements were created with Softimage, Alias and TD*I* software for use in overall



In addition to separate street-level and upper-level models, fourteen small-scale buildings were produced to provide occasional street-to-rooftop up-angles. To facilitate camera access, the building assemblage is tilted at an angle in preparation for filming. Design concepts for the various miniatures were turned over to a computer aided design system and translated into construction-ready

shot planning. Additionally, building designs created via previsualization were forwarded to the AutoCAD department where they were processed into nuts-and-bolts construction plans.

architectural plans. Windows and other detailing were mass-produced quickly through the use of a laser-cutting machine.

Different scales were ultimately decided upon to meet the needs of specific scenes. An opening sequence, dubbed Fergie's Ascent, in which released prisoner Herman Ferguson (Rob Schneider) is shuttled from the Aspen prison colony in the Cursed Earth over the glittering heights of the city before being delivered to the urban depths of Heavenly Haven – a hundred-yard-long stretch of streets and apartments – required eighth-inch-scale structures. Later, for the climactic Lawmaster bike chase, where it was paramount to heighten the drama by having flying bike riders veer perilously close to buildings and other structures, twelve models – dubbed the Canyon buildings – were built at a larger three-eighths-inch scale. While the Ascent and Canyon miniatures covered the top and mid-level building ranges, full-length building views were provided by fourteen eighth-inch-scale models. The elegant upper-floor penthouses were represented by six quarter-inch-scale building tops made out of acrylic plastic skinned with sheet aluminum and metallic paint.

Designs from the art department ended up at the AutoCAD department where modeling concepts for each building were converted into wire-frame, construction-ready architectural designs. Layers of texturing were then added from a menu of different kinds of windows and other detailing that could be produced in AutoCAD and cut with Lasercamm, a computer controlled laser cutting system. "CAD provided a systematic approach to constructing the city," explained model shop supervisor Eric Chamberlain, who oversaw a crew of forty. "We built the twelve Canyon buildings – which were eleven feet high, four feet wide and five feet long – on the gantry stage in about six and a half weeks."

The laser cutter also allowed for the creation of acrylic windows and interior detail. "These buildings were very detailed," said key modelmaker David Merritt. "We had in the neighborhood of eighty to ninety thousand windows alone. To have tried to cut out each window in traditional ways would have been insane." Although mass details, such as the tens of thousands of windows, were laser-cut parts, additional surface detailing – from fuse boxes and generators to communications devices and antennas – were produced with more traditional model building techniques. "On our Canyon set, we combined a lot of the laser detailing with cast parts, because to create the kind of depth we needed in three-eighths scale we would have had to cut maybe six or eight layers, and the laser-cutting time would have been too long and expensive. So we opted to add surface detailing from urethane resin cast in silicone molds and glued onto the buildings."

Supervising the miniature photography was Dave Stewart, whose *Blade* Runner flyovers of a futuristic Los Angeles had set the standard for every future city since. His photography of the Dredd miniatures was executed on the main gantry stage, which was equipped with a ceiling-suspended motion control camera capable of all ranges of movement. "We had on *Judge Dredd* the world's smallest Vistavision camera," Hynek stated. "It was capable of going through tiny spaces; and it could work either on the end of a boom arm or on a telescoping column from our motion control gantry."

The ascent of Fergie's vehicle from street level to the glittering world of wealth at the city's upper levels required the skillful blending of model photography with live-action filmed on the Shepperton Mega-City set using a motion control ascender rig that was built in Lenox by Tom Quinn and the mechanical effects crew. "For the shot where we had Fergie coming into the world," producer Beau Marks explained, "we had a subjective point of view that started on our backlot set in London at the Cursed Earth wall, with the camera rising up approximately sixty feet. The tolerances had to be perfect to marry the set together with the models. *If* one thing was off, then everything would be off."

The ascender rig motion files from the backlot shoot were sent to Lenox where the remaining portion of the ascent would be achieved using miniatures. "The ascender rig, which had a Kuper motion control system on it, shot the live-action foreground in real time," said Hynek, "so we had to scale that down. We shot the models on our gantry stage and backgrounds on our third stage using a Tiffen motion control camera rig."

The upper world of Mega-City was enlivened by a host of synthetic beings and flying vehicles created by Kleiser-Walczak Construction Company. To conjure up the 'synthespians' – the trademarked name for Kleiser-Walczak's troupe of synthetic performers – cyber-scans of heads, including those of some of the company's own staff members, were made. Since current scanners cannot digitize a full-size human form, eighteen-inch body sculptures were created and scanned into the computer, with textures mapped over each to create a variety of looks. Sculpted heads, rather than scanned versions, were used for shots requiring detailed closeups.

Kleiser-Walczak also created computer generated vehicles, including the flying taxi which transports Fergie to Heavenly Haven. Kleiser-Walczak began by encoding into their computer systems art department designs, reference photos and blueprints. "When we got the background plates, we could start doing motion tests with our computer generated shuttle composited over that background," company president and director of animation Jeff Kleiser explained. "We either worked from blueprints supplied to us – or, in the case of the shuttle, from an artist's design – and our animators would build whatever was needed with our modeling programs. Typically we would also take photographs of rivets and different metallic textures and map them on the surface. Sometimes we would use paint programs for specific areas of detailing so that what we were building would look like a real thing and not a computer generated object. Then we would match the lighting of the scene, create shadows on the ground and provide motion blur to make photorealistic imagery that integrated with other elements."

Tasked with combining the model photography, live-action and computer graphics elements – not only for Fergie's Ascent, but for all of the nearly two hundred effects shots in the film – was the digital compositing department, overseen by Serge Sretschinsky. "Fergie's Ascent had twenty-three layers of miniature photography and CGI," stated Sretschinsky. "Some of the shots in the sequence were especially difficult. There was one where the filmmakers wanted to place a live-action pool on top of a model building. They had shot a pool in Palm Springs from a helicopter – using what was basically an uncontrolled camera, because obviously you can't shoot motion control from a helicopter. So to position this pool we had to rely on landmarks in the image." Recreating the helicopter camera move on stage required two pieces of software: a 2-D tracking program written by

Sretschinsky, which tracked the data frame by frame, and a program written by Paul Van Camp that determined where the actual helicopter camera was in each frame and duplicated it as a Kuper file.

In the film, it would be Fergie's bad luck to be caught up in a Heavenly Haven Block War and be arrested by *Judge Dredd*.

Soon thereafter, Rico (Armand Assante) – a renegade Judge out for vengeance – sees to it that Dredd is framed for a murder he did not commit and sentenced to Aspen prison. *Ironically*, the ultimate lawman finds himself on the same prison shuttle with Fergie as they journey together over the great wall and into the Cursed Earth. Although the blasted land was pictured in the *Judge Dredd* comics as desert terrain, Cannon opted for a different look and decided to take an eight-person camera crew to shoot in *Iceland*. "Iceland was perfect for the film," noted Joel Hynek, who went along to shoot background plates. "It looked like an alien planet with different landscapes and lava flows. We were there in July, and the sun would set at about midnight, just below the horizon, and then rise again at about 3 a.m. *It* never really got dark – it was more like twilight for three hours. *Iceland* was a producer's dream in terms of shooting hours in the day."

The Cursed Earth sequence – begun when a missile launched at the prison shuttle causes the craft to crash into the wasteland – would run the gamut of practical and visual effects. Although many of the in-flight shots would be Kleiser-Walczak computer generated imagery, the actual shuttle explosion and crash would utilize fiberglass models that were approximately five feet long, with an eight-and-a-half-foot wing span. Of the four shots in the sequence, three would necessitate flying the model on wires. At a ranch outside the Magic Mountain theme park in Southern California, mechanical effects supervisor Kelly Kerby and his crew erected three towers across a 280-foot expanse. Wires supporting the shuttle models were on rollers attached to vertical *I*-beams that could travel vertically twenty-four feet from top to bottom.

Three different models were used, including two 220-pound shuttles for the pyrotechnic work. "We had to separate the wings and engine pods with detonating cord," Kerby recalled. "To get a fireball we used naphthalene – which is a flammable solid. The system was self-contained, with a battery and firing box in the craft. There was a trip-wire tied at the start point of the shuttle – which would be moving about 55 miles per hour – and when the shuttle had traveled the predetermined length of the wire, it would trip the explosives. We had extra wings and engine pods; so after blowing the shuttle up, we would have Eric Chamberlain repaint it, put new wings and pods back on, and we'd be ready for another shot."

The crash shot employed a 500-pound model launched from an air-cannon. Tests had determined both the range of the air cannon and the shuttle weight required to keep the effect in scale. "We didn't want it to skip and look like the fiberglass model that it was," Kerby explained, "so to weight the model down, we welded brackets onto the frame and added weights. Part of the testing phase was adding and subtracting weights to get the model to fly in the trajectory we wanted. Using fifty-five pounds of pressure, we were getting impact at about thirty-five feet – so we could launch the shuttle quite a ways."

Dredd and Fergie survive the crash, but find the psychopathic, cannibalistic Angel family waiting. Makeup and prosthetics supervisor Nick Dudman – whose credits ranged from Return of the *Jedi* to *Batman* – had to provide the Angels with the weathered look of their wilderness existence. "Pa Angel

was a heavily tattooed figure who supposedly had pieces of the true cross stuck to his forehead," Dudman stated. "That was a little quickie we knocked up. Junior Angel had a harelip that extended half-way up his face, which we did using a dental appliance that held the actor's upper lip out of the way, with a prosthetic piece covering it over. Link Angel was covered with gruesome sores. *In* the prosthetic workshop at Shepperton, we would sculpt up injuries and generic wounds and knock piles of them out in foam rubber."

Another member of the Angel family was Mean Machine. *In* the comics, 'Mean' Angel was a family failure. While his brothers were out making mayhem, the boy was foraging for whatever flowers might break through the crusty surface of the Cursed Earth. *In* exasperation, Pa Angel had a doctor brought in to lobotomize his son, and replace his right arm with a vicious robot limb. Although Dudman's duties would normally have involved creating the prosthetics for Mean Machine, concept artist Chris Halls – who had actually drawn the character for the *Judge Dredd* comics – was eager to do the work. "When *I* came on," said Dudman, "*I* was told that there was this young lad who really wanted to do Mean Machine. My initial reaction was: 'No. *If* you want me to come on and do the picture, *I*'ll do the picture.' But then *I* looked at this guy's stuff; and his painting was so beautiful, and he was so keen to do it, that *I* told Beau Marks: 'Sure, let him do it. *I*'ll help him in any way *I* can, because he's never put a man in a suit and *I*'ve done a fair bit of that.' But *I* spent most of my time saying, 'Yeah, that looks great,' because Chris did such a beautiful, professional job. *It* was one of the nicest prosthetic makeups *I* had seen in a long, long time."

"A new slant *I* had on the character," Halls observed, "was that Mean Machine is a human being, but over the years he's had bits and pieces of himself replaced with mechanical parts. *I* thought, if this guy's going to have a robot arm that's really big and heavy, there's no way it could just attach to a shoulder of flesh and blood. His spine and collar bone would have to be replaced to support the weight of it. *If* someone was going to rebuild himself, it would be with spare weapons parts because that would be the scrap he would find available."

To bring Mean Machine to life, Halls was given a small workshop on the Shepperton lot and eleven weeks to complete the assignment. The work began with a separate head and body cast of actor Chris Adamson, who tucked his left arm back into a position that allowed for the creation of a prosthetic stump. For the final Mean Machine outfit, a supporting harness would be worn that kept the stump arm strapped in place while the actor's own arm would be held up so that his hand touched his shoulder. Movement of his elbow would provide mobility to the prosthetic stump. The robot arm was realized as a hollow appendage that slipped over Adamson's free arm and shoulder. *Inside* the arm – created with fiberglass, aluminum and bits of steel – were cable controls the actor could grip to manipulate claws and blades. The side of the robot arm unit was also equipped with a large knife powered by a pneumatic piston.

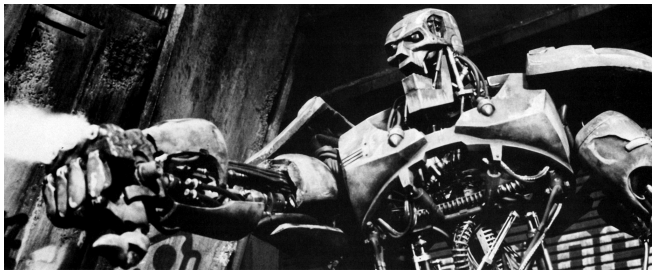
Over the harness went the prosthetic suit. "There was a whole torso prosthetic piece – from the waist up to around the neck – foamed onto a lycra suit," Halls explained. "A zipper on the prosthetics underneath the armpit allowed us to undo the bodysuit. Chris would put his arm in and slip his head through the hole in the neck. Then we'd do it up in the back and pop the vertebra – made of plastic and bits of metal – locking it into place." An attached helmet was constructed in two parts and could be snapped into position. Facial prosthetics were glued onto the actor around the eyes, nose and mouth, and blended into the neck. *Contact* lenses added a finishing touch.

Rico's ally in his personal war against Dredd and Mega-City's denizens is a hulking robot warrior with glowing eyes. Composed of fiberglass pieces backed with foam and off-the-shelf electronic components, the robot was mobilized through the use of hydraulic motion base systems mounted in the waist and neck. Hydraulics also drove the arms, while radio-control mechanisms were employed to articulate the hands and fingers. Construction of the robot – realized entirely as a mechanical effect – was overseen by special effects supervisor Joss Williams.

While Dredd and Fergie were busy with Mean Machine in the Cursed Earth, the villainous Rico was creating havoc in Mega-City One with a gigantic warrior robot inspired by another of the characters featured in the pages of 2000 A.D. The comics' ABC robot – whose acronym designator referred to its 'Atomic-Bacterial-Chemical' capabilities – was a hulking, metallic humanoid with glowing red eyes which served as the conceptual starting point for the movie robot. Joss Williams supervised design and construction of the robot, which was realized entirely as a mechanical artifact.

During the conceptual process, Chris Halls sculpted a detailed eight-inch maquette, working out a new interpretation of the heavily armored robot depicted in the comics and in preliminary art department renderings. "*I* thought it would be interesting to be able to see through the robot so you could tell that it was not a man in a suit," Halls explained. "But because the design was so skeletal, it was virtually impossible to sculpt it entirely in clay; so *I* raided my toolbox full of junk and bits of metal tubing to construct the insides. Once the anatomy was right, *I* sculpted the armor and face in plasticene, then carved in all the details. The face was kind of a cross between a human skull and a cartoon GI soldier. *I*'m very influenced by Japanese robots; so *I* brought in that sensibility, too, giving the robot enormous feet, a tiny waist and broad shoulders." Once the design was approved, Williams and a crew of five engineered and built the seven-foot-tall robot in approximately twenty weeks. Outer surfaces were principally large fiberglass pieces backed with foam to add thickness in specified areas. Off-the-shelf materials included component parts from electronic companies and printed circuit boards.

Essential to the creation of a life-size robot that could stand upright and move with degrees of freedom – ultimately on flat metal skis – was the employment of motion base technology. A small motion base – approximately ten inches wide and providing six degrees of movement – was mounted to the waist of the robot. Six hydraulic cylinders powered the unit. An even smaller electronic motion base, six inches in diameter, was installed to provide neck motion. "We couldn't get what we wanted commercially for the neck," explained mechanical effects technician *Robert* Malos, "so Brian Morrison, one of our crew members, designed a linear-drive motor system built by the engineers at Shepperton. *It* was based around a small microprocessor with an analog digital converter to drive the motor. *It* was compact enough to actually be mounted inside the robot." The robot's enormous arms – hydraulically driven – could lift forty pounds each.



Confronted by an opposing force of Judges, the robot opens fire with a battery of guns embedded in its massive hand. All of the robot functions were controlled by a team of five off-camera operators.

Convicted of a crime he did not commit Dredd finds himself in the toxic wasteland outside the boundaries of Mega-City where he encounters members of the psychotic Angel family. The most gruesome is Mean Machine – part-man, part-machine. Concept artist Chris Halls – who had drawn the character for the Judge Dredd comics – was given the opportunity to create him in three dimensions for the film.

While an animatronic creation would have required some ten to fifteen people manipulating cable controllers, the use of motion bases allowed a team of only five off-camera operators to separately articulate the head, neck, torso, arms and hands. For the motion bases, operators worked hand-grip stations powering the hydraulic cylinders for all ranges of movement, while radio-controlled arm and finger devices allowed other movements to be translated to the robot.

In the part, actor Chris Adamson wore a cable-controlled robotic arm, a prosthetic suit made of foam and a metallic helmet. Finishing touches included facial appliances and contact lenses.

Rico's rampage would also entail a string of bombings. The pyrotechnic work, including a massive bank explosion staged on the backlot set at Shepperton, was another job for Joss Williams and his special effects team. Although the Mega-City Bank bombing would ultimately look like a single giant explosion, the set was rigged for a quick succession of eight separate blasts. "We achieved the initial white flash with different pyrotechnic devices, flash powders and magnesium powders," Williams noted. "Then we broke all the glass in the windows of the bank and fired the debris and flame out afterwards to make it look as if it all went off together. The triggering device was an old-fashioned nail board. *I* told my guys how the sequence would go and how fast, which required my first working out camera speeds and timings." To add to the apparent realism – and the sense of danger – two stuntmen dressed in the helmets and spandex of Mega-City Judges would be positioned on the bank steps, with some pedestrian traffic passing by as well. "With pyrotechnics, unless you introduce some real element you might just as well shoot it with a model. Explosions have to look dangerous; but, of course, the way we prepare them makes them totally safe. The stunt Judges were cued so that when they heard the first crack of the explosion they were to begin to dive. Even though there was debris going out about a hundred feet, the way *I* positioned the pyrotechnics inside the bank, everything went over the players' heads."

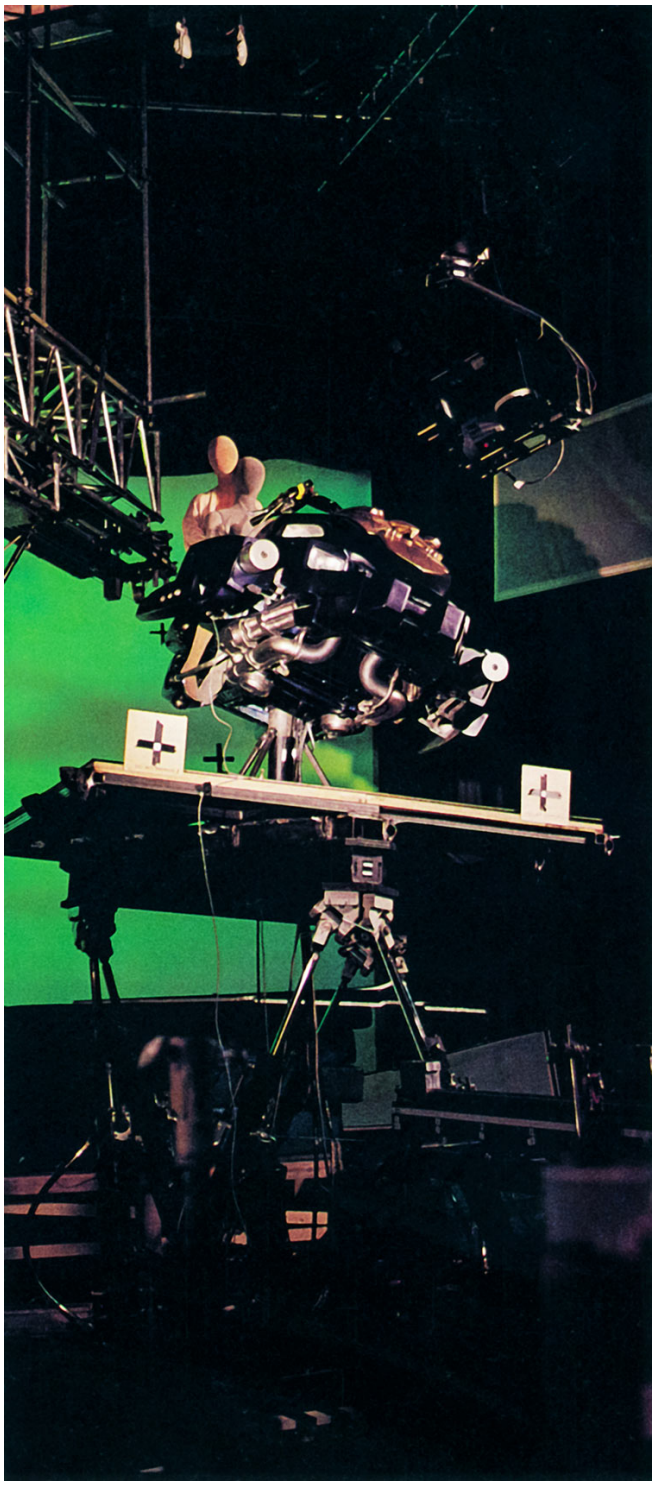
Having vanquished the Angel family, Dredd and Fergie return from the Cursed Earth and reenter the city through an incinerator chute. Once inside the city, Dredd finds himself a target of the deadly Judge Hunters. The result is one of the most spectacular sequences in the film, a life-and-death flying Lawmaster bike chase through the dense canyons of Mega-City One.

Designed as both a surface vehicle and flying machine, the Lawmaster had been drawn up by artist Kev Walker during the Santa Monica preproduction sessions and was later dimensionally realized in the form of a detailed, fourteen-inch clay model sculpted by Chris Halls. Executing the Lawmaster design full-size was a job that fell to Joss Williams and the studio craftsmen. "All of the bike frames had to be built from scratch because their wheel bases were bigger than standard bikes," Williams noted. "We had a motorcycle expert, a chap named Dave Bickers, involved in the

construction of the body, engine and framework for the chassis. Then we had the sculptors and plasterers at Shepperton create the fiberglass shells, fit in the lights and finish them off. We ended up making two different types of bikes because we felt there needed to be a powerful bike for stunt work and a less powerful, more maneuverable one for the principal artists. We built five powerful bikes with commercial 650 Kawasaki engines for the stunt people to drive. Then we built four automatics with Honda 250 engines, which were the most maneuverable, for the artists to ride. We also came up with a new stand for the bikes. Danny didn't want the bikes to pull up looking cool and then have kick-down stands that made them lean over at an angle. So we developed a two-fold stand that worked on pneumatics and was operated by the rider. When a switch was pressed, the stand came out both sides from underneath the bike – as near the center of gravity as we could get – and stood the bike straight up."

The Lawmaster chase required greenscreen work at Shepperton – with Stallone and Schneider riding bikes mounted on a motion base – and related model photography produced at Mass.Illusion and overlaid with Kleiser-Walczak computer generated effects, which included synthespians for many of the shots. The obvious ride-film aspects would also require previsualization to link up the disparate elements into one seamless sequence. Kleiser-Walczak was instrumental in previsualizing the chase, which bore similarities to chase sequences featured in the Luxor ride-film. "What happened on Luxor," Kleiser recalled, "was that the stage crews would program simple moves like a camera flying over a model, then send the move data up to us. We would create and choreograph our spaceships around that camera move. On *Judge Dredd*, the parameters were much more constrictive. During the Lawmaster chase sequence, for example, we wanted to be with Dredd and Fergie and have the camera be able to go behind them as they're flying through these huge model buildings. How does a programmer on the gantry stage make the necessary moves, not knowing how fast everything is supposed to be traveling and where the center of action will be? So we were asked to help previsualize the camera pathways and cut the whole chase sequence together in low-resolution computer graphics to see how the camera angles and shot lengths would work. Without pre-viz, there would have been no way to know what the interface was between the real world and the CG*I* world."

The Lawmaster chase aspired to the kinetic energy of the classic car chases of *The French Connection* or *Bullitt* – except that it would be with airborne motorcycles flying through the heart of a futuristic megalopolis at speeds in excess of 100 miles per hour. "The flying bike sequence was a combination aerial dogfight and car chase," said Joel Hynek. "One of the key things the director wanted was a camera-real look – not



Returning to Mega-City, Dredd and prisoner-cohort Herman Ferguson become the targets of Judge Hunters in a breathtaking chase aboard flying Lawmaster bikes. Joss Williams and his crew produced bikes both for live-action filming and for a greenscreen stage shoot at Shepperton. For reasons of safety, ultra-close camera passes were programmed first with foam dummies standing in for Sylvester Stallone and Rob Schneider.

Lawmaster greenscreen footage was composited with motion controlled model photography shot on Mass.Illusion's gantry stage. Visual effects director of photography Dave Stewart takes a light reading on one of the models.

Kinetic moves in the chase that were judged too dangerous to achieve on the motion base bikes were relegated to digital stand-ins – dubbed synthespians – created by Kleiser-Walczak. Director of animation Jeff Kleiser and animator Eileen O'Neill prepare digital characters for the film.

necessarily as you would view something through your eyes, but as a camera would see it – with things like lens flares and camera bounce. Audiences have seen this kind of thing in so many films that they have learned the perception and cues of a film camera – you actually give them a more 'real' experience if it looks as though it's been photographed."

Dredd and Fergie evade the Judge Hunters.

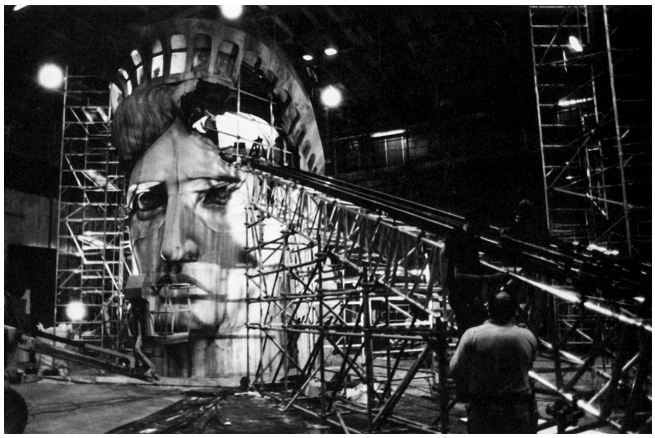
The decision to realistically capture flying camera and bike moves required a precise correlation between the motion base used for the greenscreen Lawmasters and the motion control camera rigs, operated by Eric Swenson, that recorded the action. "One of our motion control rigs was the Tiffen, which we used to shoot Dredd and Fergie greenscreen and get realistic motion," Hynek explained. "The whole database was tied together with the guys in pre-viz who knew the geometry of the stage where the greenscreen was shot. With pre-viz, we could do some test camera moves through a set and then send the file to the motion control camera. So we would know ahead of time what camera angles would work and where we needed mattes." Not all shots were previsualized in the computer, however. Approximately half were worked out on the miniature Canyon set. "Sometimes we had to look through a camera on set to see where we really wanted to fly. We would fly a semi-reflective ball through the set, the same way the bike would go. Then we could analyze that and determine how to recreate or modify – on the motion control stage – any lighting situation we had encountered moving through the Mega-City set."

The London greenscreen work was accomplished in a hectic, month-long shoot. On the stage were two separate bikes – the Dredd bike and a Judge Hunter bike – that could be photographed separately as well as together for a sequence in which Dredd jumps a flying Hunter. "That greenscreen work was the hardest thing *I*'ve ever done," Hynek observed. "It was all first unit, with three shots a day – which, for complex greenscreen motion control, was a killer. We had two rigs: a simple one that could be programmed or worked with a manual joystick, and then a complex one which was a motion base controlled by the Kuper system. For our motion control camera system, we used the Tiffen rig with a linear boom arm on a raised, three-foot platform that had fourteen feet of up-and-down movement and forty-eight feet of travel."

Although the motion control sessions would provide most of the chase material, many shots were too difficult, or dangerous, to achieve on the greenscreen stage. For those, Kleiser-Walczak would create pursuing Judge Hunters as well as digital stand-ins for Stallone and Schneider. Bodies for Dredd and Fergie were sculpted and scanned, while cyber-scans of the actors' heads provided skin texture and facial expression data needed to construct heads for the digitized bodies. To mimic the movements experienced by Stallone and Schneider on their motion base bike, Kleiser-Walczak utilized a stand-in, a motion base bike and some motion capture technology. "Our CG*I* characters had to match – not only in terms of a realistic image, but also motion and mass – the feeling of what it was like to be on board these flying motorcycles," Kleiser said. "We sat our own actor on the bike – with witness points of scotchlite reflective spheres on the body – and programmed the movement. With six high-speed video cameras, we captured the movement of the witness points.

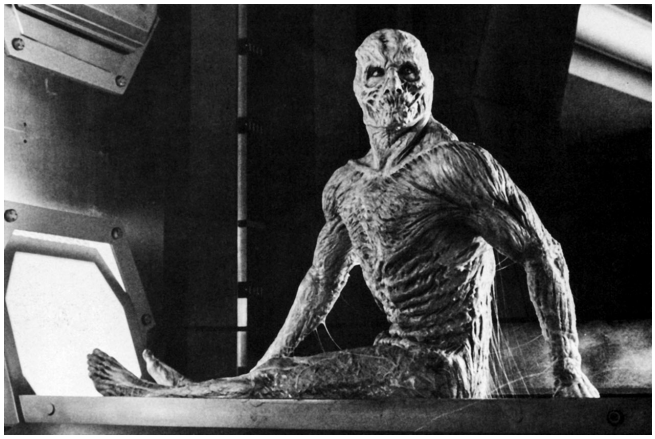
Our software could then link together these points, and the digitized form was warped into position in each frame. So our computer generated character matched the movement and physics that drove Stallone and Schneider."

Kleiser-Walczak began with motion tests of their computer generated flying vehicles; but to insure that they interacted appropriately with the greenscreen work, additional previsualization was needed. "Once the pre-viz was approved, our data would go to the gantry stage where the background plate of the models would be shot," Kleiser noted. "That plate would then be scanned and sent back to us. So instead of a dummy background, we had the real background and we could then put in our CGI characters and bikes and digitally adjust our elements to match the plate lighting and smoke level."



A final confrontation between Dredd and Rico takes place within the Statue of Liberty where Rico has established a lab to produce an army of clones. To provide sufficient space for the combatants and required props, the Liberty head was constructed at a scale twenty percent larger than the actual statue's. The replica head was carved from polystyrene, covered in plaster, then painted and aged. A pull-back motion control move on the head was achieved with an ascender rig built by the Mass. Illusion mechanical team.

The gantry stage crew and the artists of Kleiser-Walczak added another layer of realism to the chase with both practical and digital simulations of Judge Hunter guns firing and glancing off building structures. "Denny McHugh created practical effects – a whole sputtering of flash points, like bullet squibs, using flashbulbs at predetermined impact points on the models," Kleiser explained. "Once we got that footage and scanned it in, we could see where the flashbulbs were going off and could then animate over those flashes little red tracers, CGI explosions and puffs of smoke so it would look like machine-gun shells exploding as they hit the wall. Again, we were trying to make everything look as real, and dangerous, as possible. We also digitized pyro elements and would animate two or three frames as a bright light source, exploding and receding as they passed through the fireballs."



The clones found inside the lab were created by makeup effects supervisor Nick Dudman. Depending on the needs of the scene, dummies made from silicone or actors wearing full-body appliance makeup were employed. Backlighting and a complex paint job gave the foam latex appliances a translucency that mimicked the silicone.

For the climactic battle between Dredd and Rico, the production would shift from model sets and virtual capabilities in Lenox to soundstages and practical effects at Shepperton. *In* the story, a secret lab inside the Statue of Liberty – called the Janus Lab – is where Rico is creating an army of clones based on his own twisted strain of DNA. When Dredd confronts the madman in his lab and a battle ensues, some of the monstrous clones begin to crash out of their incubation units.

The Janus Lab set was gleaming white and brightly lit, with transparent floors and an adjacent dank tunnel with a spiral staircase leading up to the Statue of Liberty head. The deadly clones were contained in a hydraulically-controlled central section, with ten transparent fiberglass pods, while a morgue-like rear wall held additional incubating clones. Designed to descend from the laboratory ceiling, the centerpod configuration opened like the segments of an orange. "There was a telescopic steel structure," explained Joss Williams, "a tube within a tube on bearings connected to four half-inch steel cables that ran off the stage to a large hydraulic ram that we used to pull the centerpiece up. When we wanted to drop the centerpiece down, instead of powering it, we would just allow the weight of the center to pull the hydraulic ram back out. The speed could be adjusted up or down by restricting the amount of fluid going back out of the ram."

The clones, created by Nick Dudman, would involve actors in full-body prosthetics, plus some fifty polyurethane dummies to go into pods on the walls, as well as a few last-minute versions produced as zip-up costumes for stunt performers. The twenty-six figures that occupied the central pod and foregrounds were silicone creations designed with a translucent outer skin revealing skeletal structure, muscles and inner organs. The concept was that the Rico replicants were in the final gestation stage, still awaiting flesh and blood. "The thing *I* wanted to avoid was a Hellraiser kind of look," Dudman said. "That's been done to death. *I* decided we would go for a clone concept where everything is translucent and clear and crisp, as if blood has not been pumped in yet. Then we decided to go one step further and have their translucent skin be a sort of membrane. *If* the clones are disturbed too early, which happens in the film, the membrane breaks and everything is semi-liquid."

Dudman and his crew began with plaster lifecasts of two male subjects that were used to produce both the dummy clones and the prosthetic appliances for the live performers. The dummies were sculpted, molded and then cast up in silicone. Beneath the silicone was a fiberglass understructure which was brightly colored to compensate for the filtering effect of the translucent silicone outer layer. This provided a depth to the dummies which was further enhanced by air-brushing the surface. "Painting onto silicone is very difficult," Dudman noted, "because nothing sticks to it. We found we could do it by breaking down pigments in a single compound silicone, then diluting that with a silicone liquid until it was like water. You paint with that, and then you seal the whole thing under a coating of volatile silicone. The colors stay beautifully – and it's much less toxic than other approaches."

Duplicating the translucent forms on actors wearing full-body prosthetic appliances was a different matter. Because of the toxic risks involved in adhering silicone prosthetics to human skin, Dudman determined he would have to simulate the translucent effect with foam rubber. *Initially* he was concerned that foam would be too opaque to achieve a translucent quality that would match the dummy clones, but the prosthetics team discovered that the appearance of silicone could be simulated by mixing interference colors with the foam. "Interference colors are powders suspended in alcohol and bonded onto a base that is painted onto the foam," Dudman explained. "They are brightly colored and have an optical quality that causes them to appear to have different colors from different angles. We could put over that a layer of gel – a flexible liquid containing another set of interference colors – which diffused the colors underneath and, when backlit, approximated the translucency and depth we achieved with the silicone. Applying the prosthetics to the actors was a

lengthy business because we had to shave off all their body hair and glue pieces over every inch of their bodies. *In* prosthetics work you have to apply the pieces individually. *If* you use just one full-body piece, you lose the movements of the skin and muscle structure underneath. The more places on the body the prosthetics are anchored, the more realistic the movement."

During the battle between Dredd and Rico – and the escaping clone creatures – all hell breaks loose, with some forty explosive charges supplied by Joss Williams and his pyrotechnic team to effect shattering incubation pods, pieces of ceiling dropping and the floors bursting in a volcanic eruption of glass. Rico races up a spiral staircase from the Janus Lab, with Dredd in pursuit, and the combatants grapple inside the Statue of Liberty head. Having been relocated to lower Manhattan and fallen into disrepair, the bronze head has cracks and fissures in it revealing a perilous drop to the streets below. The scene also called for a Lawmaster on which Rico attempts to escape. To accommodate the full-scale motorcycle, plus Stallone and Assante, the Liberty head was constructed twenty percent larger than the actual statue's. Sculptor Allan Moss was tasked with duplicating the familiar face. A small prototype was built and divided into sections to help scale up the full-size head which was carved from polystyrene, covered with plaster, and then painted and aged for effect. A translight of Mega-City surrounded the giant replica. Modelmaker David Chamberlain matched the setup back at Mass.Illusion with a miniature, eighth-inch-scale statue.

For a motion control pull-back on the gigantic statue head, the ascender rig that had been used for exterior shots in the Fergie's Ascent sequence was set up on stage. To facilitate the move, the translight surrounding the head was removed and a greenscreen was wrapped around the back, upon which would be composited footage of the Mega-City models and an overlay of computer generated effects from Kleiser-Walczak.

Triumphant in his climactic battle with Rico, Dredd emerges transformed, a spark of compassionate humanity kindled by his arduous journey from the Cursed Earth wasteland to the mean streets and penthouses of Mega-City One. The film itself had been an arduous journey for Joss Williams and Nick Dudman and the effects crews at Mass.Illusion and Kleiser-Walczak – a journey that took ride-film technology to a level never before attempted. The dynamic freedom of camera movements, the integration of the various elements of models, computer graphics and live-action, and the seamless blending of backlot sets with miniatures all helped to make the comic-inspired world of *Judge Dredd* a believable one.

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DICK SMITH
50 YEARS *IN* MAKEUP

image

tribute by
Don Shay

RICK
BAKER
DICK
SMITH

I can barely remember a time when Dick Smith was not an important figure in my life.

Growing up, *I* was never into sports or any of the things other kids found interesting. All *I* wanted was to be a makeup artist. Famous Monsters was my textbook, and *I* devoured everything *I* could find on anyone who did makeup. *I* loved the work of Jack Pierce and some of the other old-timers; but of the people then in the business, it was Dick Smith *I* most admired. His makeups always looked especially real to me. Back when *I* was in grammar school, Dick did three articles in Famous Monsters, complete with step-by-step photos showing how he did some of his great makeups. *It* was from those that *I* learned some of the basics about making molds and such. There was also a book by Vincent Kehoe that had pictures of a lot of things that Dick had done.

Dick Smith was the king.

I was a freshman in high school when a classmate told me of a book he had seen at the newsstand about how to do monster makeup. *It* was by a guy named Dick something. *I* was so excited, *I* could barely contain myself. *Immediately* after school, *I* ran to the newsstand where *I* bought Famous Monsters and, sure enough, there it was – Dick Smith's Monster Make-up Handbook. *I* learned a lot from that book.

About the time *I* graduated from high school, my parents began talking about a family vacation to New York. *I* thought, "This is my chance." A couple of years before, *I* had been doing a library project and had come across a copy of Who's Who in America. *I* started looking up people – Boris Karloff and others – and Dick Smith was in there! *I* think he was the only makeup artist who was. *I* made a note of his address, and even wrote him a letter-but then *I* chickened out and never sent it. *It* was like writing to God. What was I going to say to the guy? But I was older now, and here was a chance to maybe even meet him.

So I wrote him a letter and sent photos of some of my stuff. There was a *Quasimodo* makeup and a Dorian Gray head that I had copied from his work, and some other things I had done. *Incredibly*, about two days later there was a reply in my mailbox. *It* was a big envelope, kind of spongy, and inside was a photo of a *Little Big Man* test makeup Dick had just done and a foam casting of the *Quasimodo* makeup I liked so much – and this great letter that was unbelievable. He seemed really excited about what I had sent him. *It* was a day I'll never forget.

I got to meet Dick on that trip to New York. I thought it was going to be: "Hello, Mr. Smith. It's really nice to meet you. I'm a big fan." Then we'd talk a bit and he would show me a few things and I'd leave.

It was not that way at all. Right off, he said to my parents: "Why don't you come back later – or, you know what, I'll get him back to you. Just tell me where you're staying, and I'll get him home." They said, "We can wait," not wanting to put him out. But he said, "No, I want to spend some time with Rick; and I don't want to have to worry about you." So they left, and we went down into his little basement workshop. At first I was kind of disappointed. I expected something more grand. I expected to see things on display. There was none of that.

Dick handed me a notebook, and said, "I'm going to tell you a lot of things, and I want you to write them all down so you don't forget them." Then he started pulling things out and showing them to me, explaining what I could do to improve my sculpting and moldmaking and the like. We were down there all day. He took me to dinner with his wife and kids; then we went back to his lab, and he continued telling me more and more things, late into the night. *It* was extraordinary – a one-day crash course in makeup – and when I left, I couldn't wait for the vacation to be over so I could get home and begin trying all of the things he had taught me.

That was only the beginning. We corresponded back and forth; and no matter how busy he was, Dick always took time to answer my questions and help me along. When he was doing *Little Big Man* in Los Angeles, he invited me to the VA Hospital in Westwood where they were shooting; and I got to watch him apply the old-age makeup on Dustin Hoffman. *It* was a fantastic experience for an eighteen-year-old kid to be able to sit there and watch him work.

A couple of years passed by and I was beginning to get work on low-budget features. One day a call came from Dick who was then doing *The Exorcist*. "Rick, all hell's broken loose here. I did all this preparation, and the director decided on the first day of shooting that he doesn't like the makeup and wants to change it." *In* the possession makeup that was originally approved, nearly all of Linda Blair's face was covered with appliances; and what apparently happened was that when she walked onto the set that first day, some grip or somebody said: "Oh, look. She's got her mask on now." That was all Billy Friedkin needed to hear. He said to Dick: "It's too 'masky.' Do another one." Dick had already prepared fifty sets of all the pieces – enough for the entire show – and he had to start over from scratch. He needed some help. Would I be interested in coming to New York and working with him? "Gee, I don't know, Dick. I'll have to think about that one."

I was on the first plane east.

That was the real start of my education. Dick, of course, did all the creative work and the sculpting. My job was to make the molds and run rubber for him. I began by doing it my way, which was based on things I had read and figured out for myself and a lot of things Dick had told me. Dick very quickly let me know that I had a lot yet to learn. He was extremely meticulous and particular about every aspect of every task. He would show me how to run rubber, for example, and then sit there and watch me do it, commenting and correcting me every step of the way. *It* was scary – a real trial by fire – but it was a great way to learn. Later I got to do a little sculpting, and I worked quite a bit on the Linda Blair dummy with the rotating head. I also got to go to *Iraq* and assist Dick in making up

Max von Sydow. Everything about that experience was magical. Not only was I working with the man I had most admired for so many years, learning things I might never have learned on my own, I was even living in his home like a member of the family.

After the initial mad rush was over and things started settling down, I got into a routine of running foam rubber twice a day. Since that was pretty much all I was doing by then, I had the middle part of the day free. Dick was spending most of his time at the studio at that point, so I asked him if I could go through his files. He said sure. He had file cabinet after file cabinet filled with notes and photographs – all kinds of things. Fabulous makeups I had never seen. I would leave things out and ask him about them at the end of the day, if he was still awake. "What is this Dick? This is great." And he would patiently answer all my questions. There were times, on the weekends, when he would be there and we would work together in his lab. He was always telling me about the old days of live television. *It* was just the best time.

The Exorcist eventually came to an end; and I returned home, much enriched. A true mentor, Dick continued to guide and assist me, even recommending me for jobs he was unable to do himself. I got to do The Autobiography of Miss Jane Pittman – a major project early in my career – because Dick suggested me to the producers. My career began to take off.

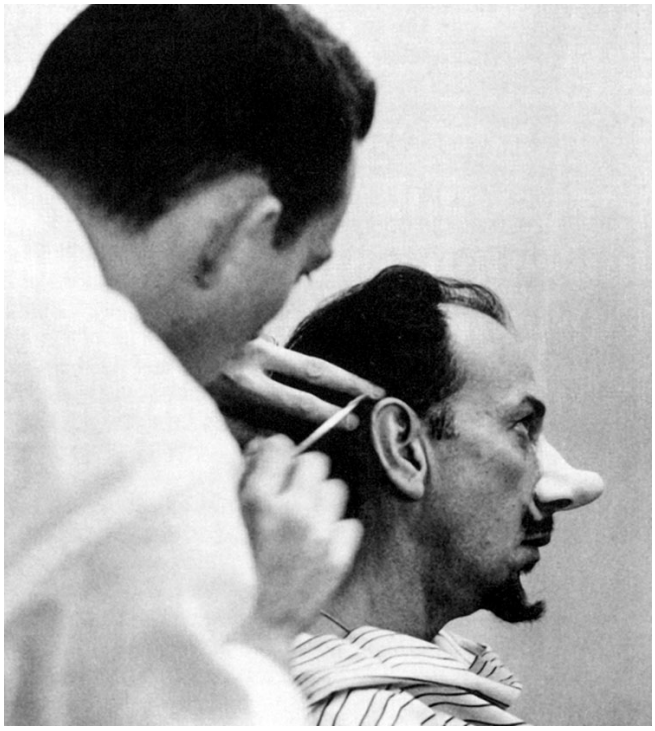
I became an apostle, spreading the word of what I had learned from Dick Smith about moldmaking and foam and overlapping appliances. No one on the West Coast held Dick in much regard at that time. He was that guy from New York who was given all the time in the world to work on things and who used that stupid George Bau foam and did appliance makeups with multiple pieces when one would do just as well. I used to get furious with these people and argue with them all the time. I felt strongly that the Dick Smith way of doing things was better. This went on for the longest time; but then I slowly started seeing people come around. All of a sudden, they were beginning to realize that Dick Smith was not just this guy who demanded and got a lot of time to do things his way. He was an incredible artist who was doing things in ways that were different – and better. Today his influence is everywhere.

Probably because no one would tell him anything when he was starting out, Dick has always been the most generous of people when it comes to sharing his formulas and techniques. And he managed to instill that ethic in all of us by going around and visiting different artists and shops, spreading the pollen of information. Soon, everyone started opening up. Beyond that, Dick Smith is the person, more than anyone, who elevated the state of the art and the status of the makeup artist everywhere. He fought for integrity in the work and he fought for good screen credits. There is no one in makeup today who doesn't owe him a debt of gratitude.

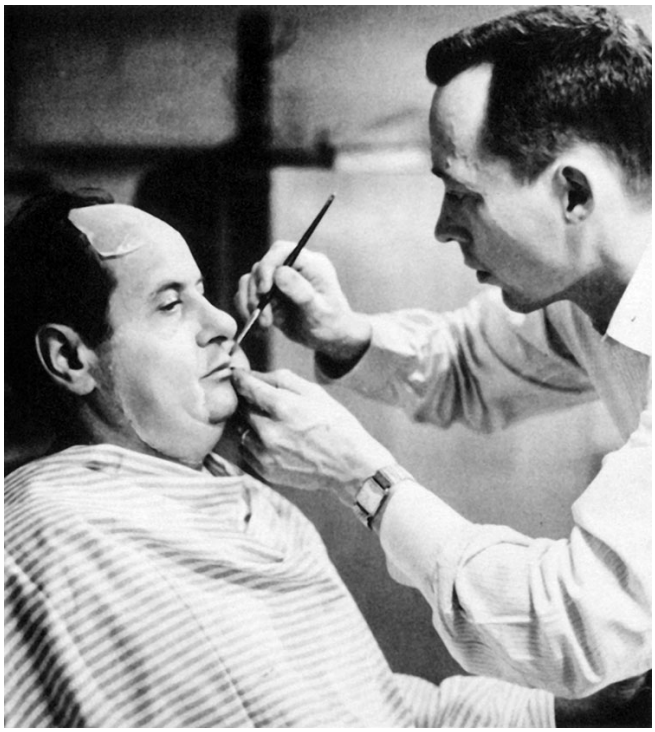
Years ago, when I was just getting started, Dick Smith gave me a letter of recommendation that stated my work was very good and that in five years time I was going to surpass him. I was tremendously flattered. A couple of years later, he said: "I was wrong. You've surpassed me already." I laughed and told him: "Thanks, Dick, but that's bullshit. I'm never going to surpass you. No one will."

That was twenty years ago. I still believe it.

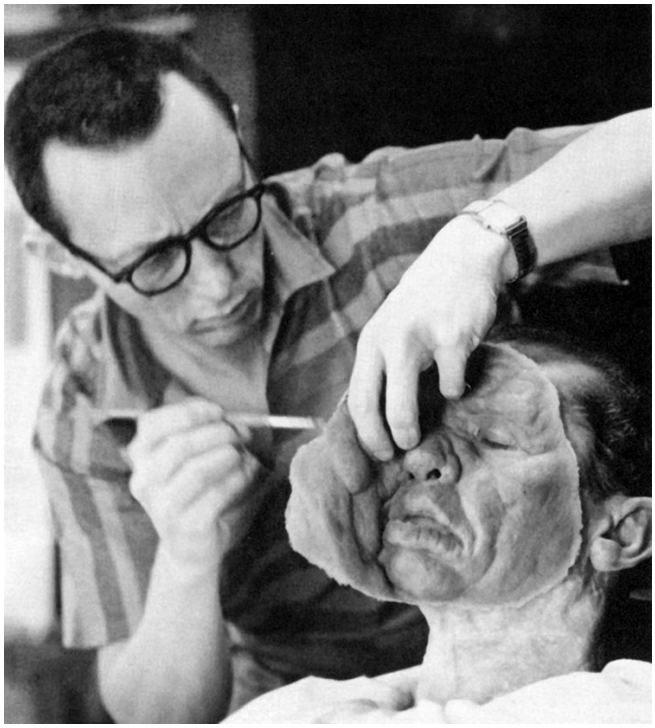
Fifty years ago, Dick Smith was hired as the first staff makeup artist at NBC Television. One of his earliest character makeups was on Stephen Courtleigh for a live presentation of Abe Lincoln in Illinois. Jacket and tie was the attire of the day, even for messy makeup jobs.



Smith adds finishing touches to Jose Ferrer in an early production of Cyrano de Bergerac.

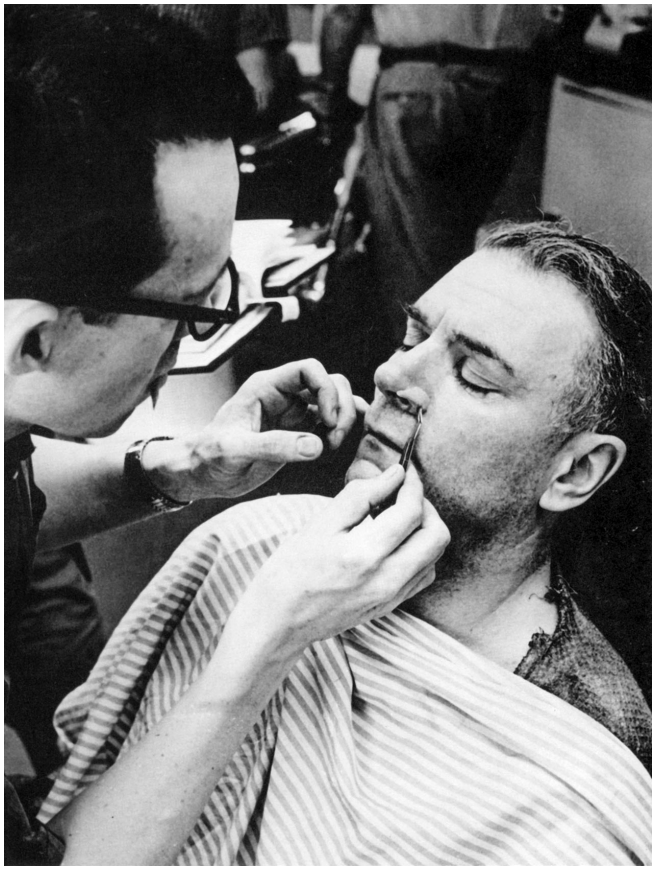


Smith – who provided or supervised the makeup on every show produced at NBC New York for fifteen years – applies foam latex appliances to Eli Wallach for his Sancho Panza role in Don Quixote.



In 1960, Smith left the network and spent the next two years at Talent Associates working on television productions for David Susskind. For the macabre series, Way Out, he applies a Quasimodo makeup on Alfred Ryder.

No one who has met Dick Smith would be surprised to learn that one of his early makeup assignments was for a television adaptation of The Picture of Dorian Gray. After fifty years in the business – and looking, easily, a decade younger than his age – Smith is still a vibrant and active innovator in the field he popularized and populated with several generations of accomplished protégés. Surely there must be a really ugly portrait somewhere in his attic.



Among the highlights of the period was working with Laurence Olivier on The Power and the Glory.

Despite evidence to the contrary, however, Dick Smith is at present dispelling rumors of his demise.

For most of his half-century career, Smith and wife Jocelyn lived in a small middle-class home in residential Larchmont, New York, not far from where Smith was born on June 26, 1922. Over the years, that home – which served also as his studio and laboratory – became a mecca for makeup enthusiasts, young and old, who for decades sought information and counsel from the veteran artist. Despite the lure of warm weather and the fact that his career – which began in New York with live television – eventually became focused principally in Hollywood, Smith elected to remain in Larchmont for nearly forty years. From the basement of that modest home emerged a profusion of memorable characters and creatures for films such as *Little Big Man*, *The Exorcist*, The *Godfather* I and II, *Altered States* – and Amadeus which earned Smith a long-overdue Academy Award.

So it came as a surprise to many when, two years ago, he and Lyn sold the fabled homestead and moved south to Florida where they purchased a lovely replacement on the small island of Siesta Key on the gulf coast. No significance need be read into the fact that Siesta Key is accessible from the mainland only by drawbridge, for Smith has continued to be as open as ever, working on projects in his garage studio and maintaining contact with a vast network of makeup artists and acolytes around the world.

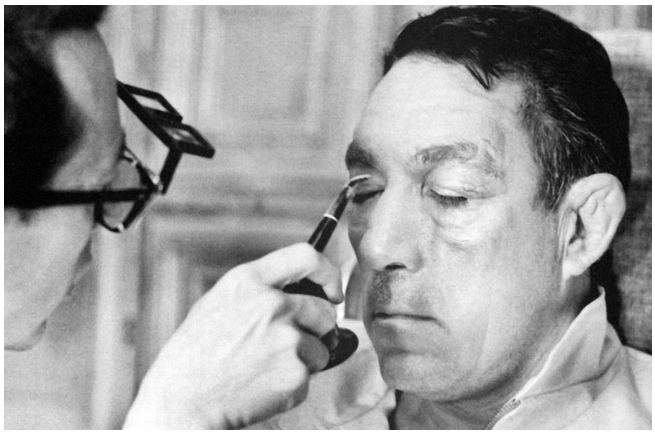
But there are always some who never get the word. When, after a year, the post office discontinued forwarding mail from Larchmont and began returning it with 'Addressee Unknown' stamped across it, rumors began to circulate. Dick Smith, a lifelong New York loyalist, surely must have died.

To paraphrase Mark Twain – whose likeness in Mark Twain, Tonight! won Smith a makeup Emmy – reports of his demise were greatly exaggerated.

You have a reputation for being extraordinarily generous in sharing your formulas and techniques with others. Many people in the business consider you a mentor and teacher. Was there anyone like you in the field fifty years ago?

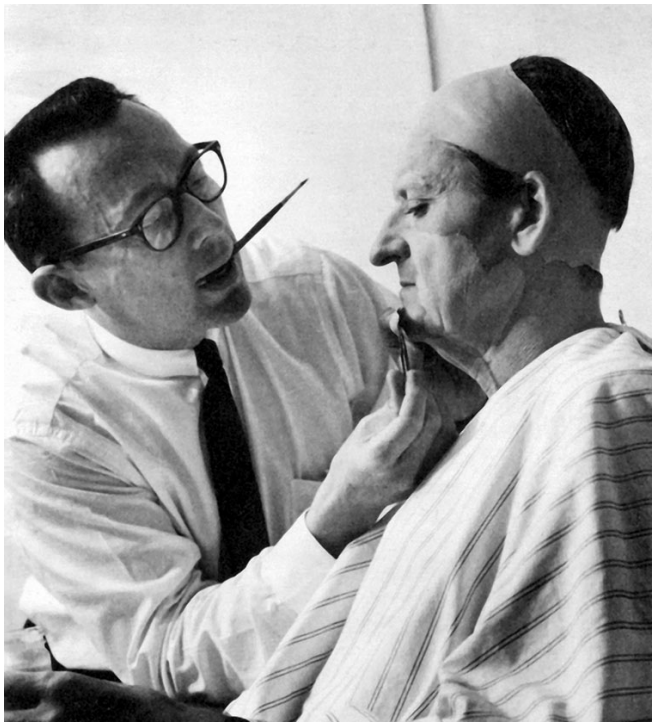
Young people can't imagine what it was like back then. *In* 1945, when I started out in New York, there were maybe four or five makeup artists – period. Just four or five in the whole city. None of them would give you the time of day.

Pretty much everything I learned was by experimenting and trying things. The things I didn't know when I started – even basic things – would fill volumes. I remember, back in 1947, seeing an article in Life magazine about a movie called *The Lost Moment*, with Agnes
Moorehead playing 110 years old. I'd been at NBC about two years at that point, and the previous year had tried to do a Lincoln makeup that had failed, because when I put greasepaint on my crude latex appliances, it turned all powdery. So here I am, reading Life magazine, which has a fantastic full-page picture of this old, old makeup done by Bud Westmore, and it says: "He used cotton and spirit gum and rubber mask grease." And I said, "What the hell is rubber mask grease?!" So I wrote Max Factor and asked them about it. Sure enough, the answer came back, and it said: "It's actually called rubber mask greasepaint and it's used on rubber appliances. We make it." Eureka! That was one of the first, most important bits of information I gleaned. So that was kind of typical of the ignorance I started with.



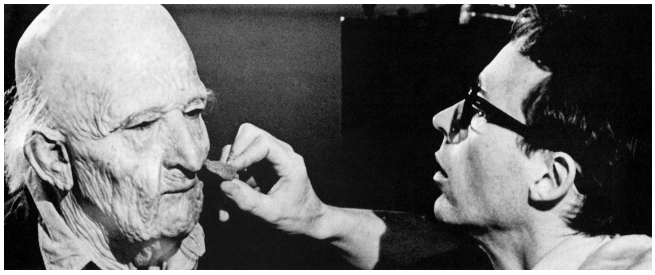
Smith earned his first feature film credit on Requiem for a Heavyweight using makeup to transform Anthony Quinn into a past-his-prime prizefighter with abundant physical reminders of bouts won and lost.

As a rule, people tended to be secretive back then. There was not all that much makeup work in New York – and Hollywood might as well have been on another planet. No one out there was eager to share anything; and the union did its best to discourage whatever inclination there might have been. I remember, in 1951, a group of us arranged to hire Gus Norin – who was a very fine and experienced Hollywood lab man – to come to New York for two weeks and give a seminar on how to make molds and appliances. Up until then, I had no idea how to make a proper mold; so this was a major event for me and about a dozen other young New York artists. All of us chipped in to pay Gus for his time and travel and expenses – and about $1000 that he would have to pay to the Hollywood local for breaking a rule that members could not teach anything to anybody. For a union member to let out secrets to outsiders was strictly verboten. So that was the atmosphere at the time. I thought it was terrible, and I've done my best over the years to dismantle that kind of thinking.



When Hal Holbrook agreed to present his acclaimed one-man show of Mark Twain, Tonight! on television, Smith was engaged to prepare an elaborate makeup that rendered the actor a very passable double for the noted author and humorist. Smith earned an Emmy for his work on the production.

Your home base was always new York, but you did a lot of work over the years in Hollywood movies. How were you received out there?



On location at a veterans hospital, Smith adds final details to a landmark makeup which transformed Dustin Hoffman into a 121-year-old westerner whose ramblings form the basis of Little Big Man. Smith's debut employment of multiple overlapping appliances would eventually become a universal technique.

My first experience working in Hollywood was when I was called out to work on It's a Mad, Mad, *Mad, Mad World* – the scene at the end where everyone's hanging off the collapsing fire escape. Bud Westmore was the head of Universal makeup at the time. I had met Bud and he had liked my portfolio; but the only reason I got the job was because at the very last moment, Stanley Kramer decided that he wanted appliance makeups on all the stuntmen so that they would look more like the actors. Bud was totally occupied with The List of Adrian Messenger at the time; and no other appliance guy in Hollywood wanted to touch it because it was such a big job and on such short notice. So Bud decided to break the union rules and bring me out. He had very little choice, really. I accepted the job without even asking what it entailed – and I accepted union scale. When I got out there, I found that I had to do ten or eleven stuntman masks in just three weeks. I would normally have taken three months to do that at home! *It* was a monstrous job. Literally, I worked twenty-three hours a day for three weeks. I would work until about midnight, then stop and walk a couple of blocks to the motel where I was

staying, sleep for one hour, get up, take a quick shower, then go back to the studio and continue. That was my life for three weeks – but I was only forty then, so I could take it.

My next big experience was *Little Big Man*. Basically, I was hired to do all of Dustin Hoffman's makeups, plus a few others, while another makeup artist was brought on to take care of everything else – all the *Indians* and whatnot. *In* my presence, this fellow was perfectly affable; but I kept hearing about snide, critical things he was saying behind my back, especially about the way I was dividing the old-age makeup into overlapping pieces. That had never been done before; and everyone thought I was crazy and that it was totally unnecessary. Of course, since then, pretty much everybody has followed my lead, and I practically never see the old way done anymore. Then there was another very well-known makeup artist who was always friendly to me on visits. I used to come out, travel around and learn as much as I could. *It* was no one-way street, mind you, as I was open to reciprocate and exchange whatever ideas and techniques I had developed. But it got back to me later that this one chap, whom I thought was a friend, would see me coming, and say, "Oh, here comes Smith, sucking around again, snooping." So there was hostility, especially at first. I was from New York – which was considered enemy territory – and it took a long time to get accepted.

From the sixties on, your work was primarily in feature films. Why did you elect to remain in New York, rather than move to Hollywood?

I had been to Hollywood on visits many times, and had friends there and enjoyed it. So I had nothing against Los Angeles. But my roots were in New York. I was born in Larchmont; and though I didn't live there during my teenage years, still, it was home. Moving – as I well know now – is a bitch. Particularly when you have a lab – even the little lab I had in my basement. My attic in the Larchmont house was chock-a-block with storage shelving and stuff piled everywhere – molds and other materials going back years. So the idea of moving was traumatic, especially all the way out to Hollywood.

Then, too, I didn't know how I would be treated. I was an outsider, and had always been treated like one. I could work in Hollywood from time to time, as long as I went back to New York. But to come out and stay there, I would have immediately threatened people with competition – which would have been difficult. Plus I would have to go from being a big fish in a little puddle to being one of a lot of big fish in a bigger puddle. *It* was not a welcome thought.

There was a period during the mid-sixties, though, when I thought I would have to move to L.A. I considered myself a film artist at that point, but there was very little film work being done in New York – at least my kind of work. I was constantly on the lookout for films that had anything special in them – not low-budget junk with monsters and such, but real features that people might actually go to see. *In* a year, there might be one film made in New York that required special makeup of some sort – one film for everybody. I remember trying desperately to get hired on *The Swimmer*, where the entire creative aspect would have been putting body makeup on Burt Lancaster in his bathing trunks as he swam from pool to pool – that was it. And I lost that job. Producers wouldn't hire me for an ordinary film with straight makeup. They could hire a regular makeup artist much cheaper. So there was a long period in there of relatively little creative work. Television was my salvation. Just about the time I was beginning to think that a move to Hollywood was inevitable, along came Mark Twain, Tonight! and a number of other projects that sustained me.

Eventually, you did work in Hollywood from time to time. How did that come about, and how were you able to overcome union objections?

Because of my work on *Mad, Mad World*, I was entitled to go on the *Industry* Experience Roster. Do you know what that is?

No.

It was an anti-labor device, really. Labor laws specified that there could not be a closed shop agreement. *In* other words, the union could not force the studios to hire only union members. To get around that, the contract between the unions and the studios stated that the studios would agree only to hire people from the *Industry* Experience Roster, meaning a list of people whom the parties to the agreement felt were qualified. Well, that was like a surrogate for the union membership, because the only people on the roster were union members. But the contract also stated that anyone who worked in Hollywood for a specific number of days as a paid makeup artist would become eligible for the roster – even if they were nonunion. There was a test to be taken, though. Because of *Mad, Mad World*, I was eligible, but I had never taken the test – never needed to. But at my low point – which would have been about 1966, when I thought I might actually have to move – someone suggested it would be a good idea. So I studied like hell and went out there to take the test-very apprehensively, I might add, because it would have been easy for people out there to crucify me. I went into the room where the test was to be taken, and Bill Tuttle happened to be the committee chairman. Bill was very cordial. He turned to the other judges, and said, "I don't think we really need to examine Dick Smith, do you?" And they all agreed. That was it! I never had to do a thing. I've been indebted to Bill Tuttle ever since for that kindness and consideration. *It* was really one of the nicest things that ever happened to me in Hollywood.

The final footnote to that story took place ten years later when I was out in Hollywood working on *The Fury*. Howard Smit – who was the business rep for the makeup local – showed up on the set one day, and said: "You haven't joined the union yet. Here's an application. I want you to fill it out." I was kind of flabbergasted. I said, "I understood I had to be a resident." And he said: "Nah. You're working out here. You really should be in the union." So all of a sudden, after all those years of keeping me out, they wanted me to join. So, of course, I did. Having union cards in both New York and L.A. was a definite advantage. Phil Rhodes and I were the only two who could work either place without any union problems. Phil was Marlon Brando's makeup artist and Marlon had put pressure on the union to get him a West Coast card. For me, having both cards meant that there was even less necessity for me to move to Hollywood, because I could do preparation work in Larchmont and then travel to L.A. – or to Timbuktu, for that matter, wherever they were shooting. The only thing it meant was that when people hired me, if they were located in Hollywood and I had to go out for conferences, they had to pay my way. That was never much of an obstacle.

I think anyone who has a notion of the kinds of facilities that Rick Baker or Stan Winston or Rob Bottin have would be surprised to learn that most of your life's work came out of a small basement workshop in a middle-class home.

You know, just a few days ago, I was testing the hookups on my new television set and I put on a laserdisc I hadn't watched in years. *It* was one of a series done in Japan on special effects, and they had come to Larchmont to interview me for it. So I pop this thing in, and what do I see but a shot of

me leading the cameraman down a narrow flight of stairs – past shelves of groceries – and into my tiny little studio. And it was really odd. For the first time, I saw it with the eyes of a stranger – and I was a bit appalled. Talk about first impressions. I thought about all the celebrities and big-name actors I had had down there over the years, and I wondered what they must have thought. It's amazing some of them didn't turn right around and leave. Fortunately, my reputation must have been sufficient to overcome the negative image.

How much work space did you actually have?

Well, the studio part, the first room, was about ten feet by fourteen feet, something like that. Then there was a back room where the furnace was that probably had about the same square footage – maybe less. Sometimes it wasn't enough. *Altered States* was the biggest project I ever had. For that one, I had to take over part of the upstairs. Our sons were grown by then, so I converted one of the larger bedrooms into a studio. My little one-car garage was also gobbled up – we put a big oven in there. We even borrowed the basement of the elderly couple who lived next door.

Ray Harryhausen has commented about how strange it is for him to go to big effects movies these days and see in the end credits that a hundred people, or more, were hired to do the work he used to do all by himself. You must have similar feelings sometimes.

The business has changed tremendously in the last twenty years. Special effects have had a profound influence on makeup – and, in a way, I think one can trace the advent of that to *The Exorcist* I did all of the work in *The Exorcist* with just one part-time assistant – a young guy named Rick Baker who came out and helped me. He was my total crew, except for a few assistants on the set. Now, twenty years later, Rick has a shop of his own as big as a factory, employing seventy-five people for a whole year on films like *Gremlins* 2.

Do you find more talented people in the field now?

God yes! When I started in television, I was the only makeup artist at NBC. Within five years, I had twenty others working for me – and I trained them all. None of them had any exceptional talent. *In* fact, they were barely adequate. Only one guy – Bob O'Bradovich – had a certain flair. But people who were attracted to the field were very different then. I had a couple of former hairdressers working for me and some ex-actors – even one guy who was an elevator operator.

When Rick Baker came to visit me as a teenager, and I saw his very obvious talent, I was just floored. *It* was truly extraordinary finding someone who had, certainly, as much talent as I had – probably more – and at a far earlier age. Nothing like that had happened to me in twenty years in the business. Later, when special makeup effects came into their own in the seventies, I began seeing more and more really talented young people who were interested in makeup. *Quite* extraordinary, some of them – brilliant sculptors in their early twenties. I look at some of their work and marvel at it. "Jeez, I couldn't do that. That's better than any sculpture I've ever done." So it's evident that the field is attracting people who, in my day, would never have thought about it or known about it. Young people with the kind of artistic talent I see today would have become commercial artists or illustrators or ad men – maybe even genuine sculptors or painters. They would never have dreamed there was something really creative in the makeup field. But the opportunities now are just endless.

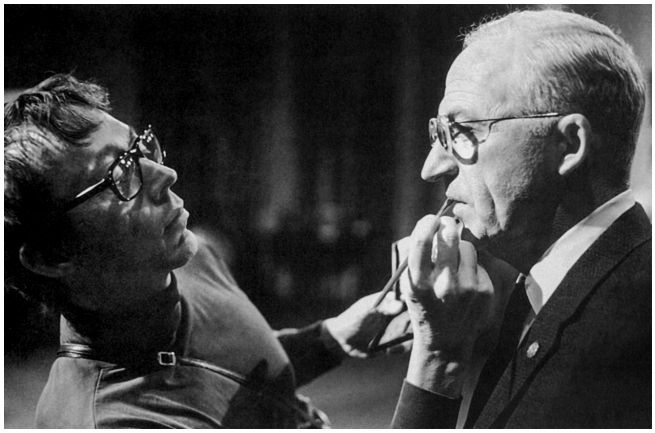
The only still photograph of Linda Blair in demonic makeup for The Exorcist. In addition to the appliance makeup – which became increasingly grotesque as the film progressed – Smith employed primitive bladder technology for a scene in which the youngster's throat expanded like a frog's. Puppet replicas were constructed for other scenes in which writing appeared on her abdomen and her head turned completely around. Using an adult double, Smith also devised a means to produce a violent vomiting effect. To preserve secrecy during production, the unit still photographer was forbidden to photograph Blair in makeup; but Smith shot a roll of film for his personal files. When he later informed director William Friedkin that he had done so, Friedkin asked to borrow the negatives so he could make prints for himself. The negatives disappeared while in his possession – and only this single print survives as a still record of the work.

As a result, growth in the field has been enormous. *In* fact, I think there's probably more good people than there are jobs now; so maybe the influx of talent will die down and wither, I don't know. But the demand is still high. Even ordinary films today are using makeup and special effects or computer generated images. So I have a feeling there will continue to be a lot of work in the field. *In* recent years, the big robotic creations that people have come to associate with special makeup effects have gotten the most attention. But a hell of a lot of good old-fashioned appliance makeups are still being done.

That's been a long-standing issue, particularly with regard to the Academy Awards. What constitutes makeup and what constitutes something else? The Academy has defined makeup very narrowly in recent years, but it used to be somewhat less restrictive. *Greystoke*, for example, was considered eligible in 1984; but four years later, Gorillas in the Mist was not.

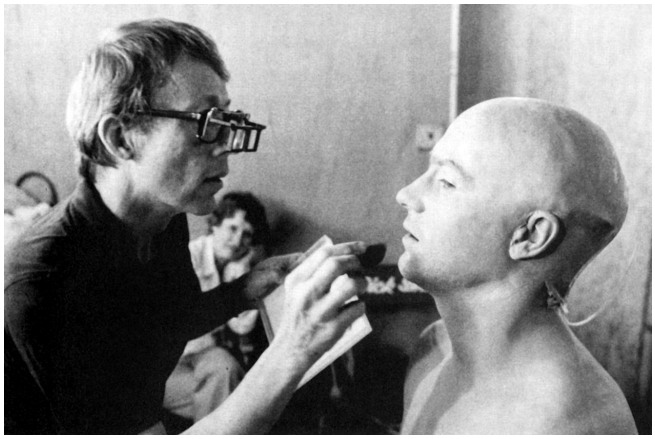
I've always been against drawing a firm line. The only fair way to deal with it is show by show, because there are always variables. Of course, there is one clear rule – makeup must be on an actor. A puppet is not makeup, even though so many wonderful mechanical puppets are made by makeup artists. With Gorillas in the Mist, I think I would have voted for that being makeup, because, as I understand it, the only difference between it and *Greystoke* or *Harry and the Hendersons* was that mechanical eyes were used rather than the actors'. I feel that the use of a mask and suit, in partnership with the makeup artist's control of the eyes and mouth expressions, is the ultimate makeup transformation, and not at all the same as an actor simply wearing a costume.

I feel that a very difficult and more frequent problem is when opticals or special effects or puppets are mixed with makeup effects so well that the audience can't tell where makeup ends and non-makeup begins. I can think of a couple of times in recent years where a film has won for makeup when, in fact, voters were probably swayed by some showy puppet or CG work.



Smith adds final touches to an appliance makeup he devised to transform Ed Flanders into Harry S. Truman for a television production of Harry Truman, Plain Speaking, a one-man show celebrating the wit and wisdom of the former president.

The year I got my Oscar for Amadeus, my chief competitor was Rick Baker with *Greystoke*. I personally felt that Rick's work was equally worthy of the Academy Award – possibly more so. Certainly there was a lot more to it. His aging of the principal apes was just as good, just as realistic, just as fine, in some ways even more complex, than my work on F. Murray Abraham. But people relate more to humans than apes, and Murray's performance was certainly more affecting than any ape's. So I really thought I won on that. *It* was a very hard call; and I thought it would have been equally just if Rick had won. *In* fact, I felt badly for him. That was the only thing that kind of soured the glory and the joy for me.



Smith spent nearly two years on Altered States, only to have much of his work deleted or obscured in the final release. Near the end of a lengthy makeup session, he painstakingly blends facial appliances and a bald cap onto William Hurt. The appliances, equipped with microthin bladders, were used to create pulsating protrusions on the

How do you, personally, judge a good makeup?

A good makeup doesn't look like makeup. It's that simple. But to break it down into details is difficult. Sometimes you can't even put your finger on it. I remember a makeup that was done by an excellent makeup artist friend of mine – an aging makeup that was difficult because the actor had some

elusive quality of youth not only in his face, but in his mannerisms. And so it really didn't work. *It* was done over by another makeup artist – also an excellent artist – and it was successful, but borderline in my opinion. Artistically and technically, it was a superb job, but there was still an element of youth that said this is a makeup – at least it said that to someone like me who is very critical. Now, to give you the opposite example, I remember one that knocks me out to this day – and that's Rick Baker's makeup on Eddie Murphy as the old Jew in *Coming to America*. Rick had told me that he was doing makeups for the film; and although he didn't describe them, he did mention something about an old man. When I finally saw the film, it didn't dawn on me until ten minutes or so after the scene that "Good God! Could that have been Eddie Murphy?"

actor's face for scenes in which his character first shows signs of a physical transformation triggered by sensory deprivation and drugs.

It was so believable, so real. Of course, Eddie Murphy's performance was vital to the success of the makeup, but makeup never even entered my mind when I saw that scene. That was a great makeup. Rick should have won the Academy Award that year.

The examples you've cited have been character makeups. How about monsters? You were drawn into the business because of the monster makeups done by Jack Pierce and others. What makes for a good monster or creature makeup?

The element of believability must still be there, even when you're creating an alien or some other extreme form. *It* still has to make sense in terms of looking like something Mother Nature might have dreamed up. Doing an alien makeover on a human face and body is terribly difficult, because if any part of it looks too human it will not harmonize with the more extreme qualities of the rest. One has to consider every aspect of the form – arms, legs and so on. A good example is the Giger alien. Our first response is that we're taken aback and overwhelmed by the incredible elongation of its skull and by the lack of eyes and this multiple mandible device in its mouth. There's nothing human about that face at all – yet everything seems to be functional, so we buy it as real.

What do you consider your personal bests?

The list hasn't changed much over the years. I still think *The Exorcist* encompasses, in one film, an enormous amount of top-quality work. Not all of it is the best, but the makeup on Max von Sydow – the aging makeup – is very good. *It* works and is believable to most people; but there are many imperfections and things that I would do differently if I had it to do over. All in all, the demonic makeups and the effects that I created make that a body of work that is right up there on the top of my list. But how do you compare that with Amadeus, which is perhaps my best aging makeup? Or with *Little Big Man*, which was even better in some ways – one of my greatest creative efforts – but, because of the technology of the time, was not as good in others. One of the reasons that both of these makeups are successful is the acting. F. Murray Abraham gave a rich performance with great facial expressions that really brought that makeup to life and made a truly fascinating character. Dustin Hoffman was more limited by his character; but he went as far as he could possibly go under the constraints of the role, and he was wonderful. So I was very lucky. Those three are my favorites.

You worked on quite a few projects with Dustin Hoffman, and then had a falling out over Tootsie. Would you care to talk about that?

I loved working with Dustin. He's a very funny guy, with an outrageous, ribald sense of humor. I first encountered him on a TV taping of Star Wagon in 1966. He had to be aged at one point; and it was an awful, slapdash makeup plagued with technical problems because I had tried to use a new spirit gum and it wasn't holding and everything was falling apart constantly. *It* was not a great experience.

Then along came Midnight Cowboy. It's like a *Friday* or a Saturday, and I get a call. They're going to shoot Monday, and the Ratso Rizzo makeup is not right. Can I come and help? I went in and designed that makeup right on the spot – then, after a few days, turned it over to the unit makeup artist who did it for the rest of the film. A year or so later, I get the call for *Little Big Man*. *It* was a Hollywood movie, and there was a long period of negotiation about my fee; and Dustin backed me up. Without him, I wouldn't have gotten it. So that was nice. Working with Dustin on that film was quite an experience. The old-age makeup was the flashiest part, but I did all of the other makeups on him as well. He had to be young; he had to be a hermit; he had to be a drunk. *It* was a long shoot. We went through 100-degree weather in the summer and 32-below-zero weather in the winter. We were on location practically all the time, and Dustin went through hell in many ways. He didn't like to sit a long time for makeup, but he would do it because it was necessary. We got along well.

After *Little Big Man*, we were working together again on Who *Is* Harry Kellerman; and one day, Dustin said to me: "You know, Dick, I got my first good contract on *Little Big Man*. I get a percentage after $20 million gross; and it's almost at the point where I'm going to start getting that. I want to give you some." I said: "Dustin, you don't owe me anything. Gosh, no. You don't have to do that." He was insistent: "No, no. It's not going to be much, but I want you to have it." *It* turned out that what he intended to give me was one percent of what he had earned. Sure enough, in a couple of months I got a check in the mail – and it was quite substantial. That continued-semiannually or quarterly, I forget which – for a number of years, and the total ran to a very sizable amount. I have talked to other people – makeup artists and actors and so forth – and it's simply unheard of for a successful actor to share his profits with anybody, much less a makeup artist. So, obviously, Dustin appreciated my work. And he appreciated it in a very concrete way, for which I will always be indebted and will always love him.

Some years passed, and Tootsie came up. Dustin wanted me to do it; and I, of course, agreed. The film was in development for about a year and a half while the script was being rewritten many, many times; and during that period, I was involved in a number of tests – about three, as I recall – each with a different cinematographer. The last one's approach was to employ the harshest possible fluorescent lights, the reasoning being that if Dustin looked good in that light, he would look good in anything. Well, it was disastrous as far as the makeup was concerned. *It* showed every pore in Dustin's rather coarse, textured skin. One of the biggest problems I had was covering his 5 o'clock shadow. I was experimenting, trying to find something that was rub-proof, because at the time he was going to be wearing white nurse's uniforms and I knew there was no way we could get through even one take without them being ruined with rubber mask greasepaint. What happened next is complicated; I don't know exactly, really, what did happen. All I know is that we stopped communicating. I could get no communication from Dustin or the director. Then I found out that there was another makeup artist who was going to be doing some tests with Dustin. I was angered by that, my professional pride was hurt, and I quit the picture.

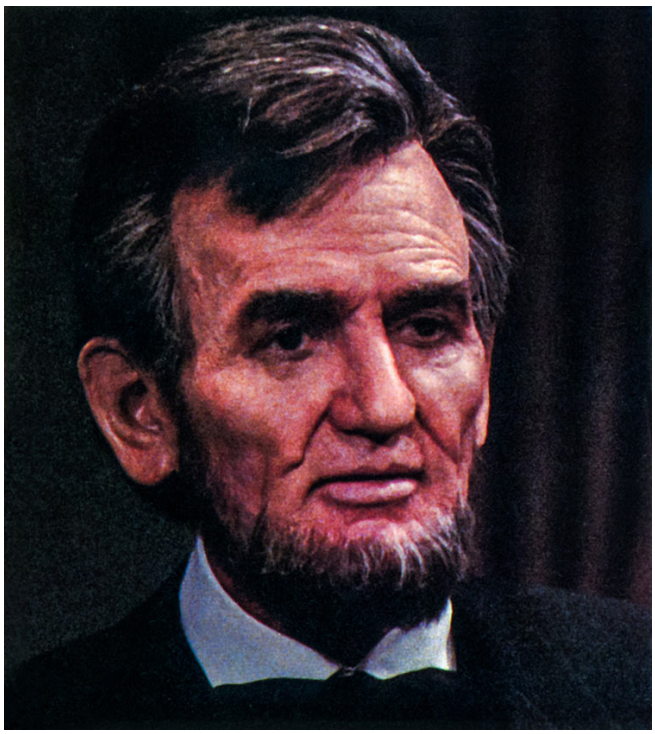
In retrospect, I think Dustin just wanted to be sure that he was doing everything he possibly could to make his performance a success. He was leaving no stone unturned. One thing we had never discussed was making him a pretty woman – not just a woman. Somewhere along the line, without telling me, Dustin apparently decided he wanted to look as pretty as possible. Being attractive is part and parcel of being a woman – and Dustin decided that was what he wanted. My one contribution, I guess, was the beautiful feminine teeth that he wore in the part and which helped make the transformation work. But my intent was not to make him look younger or more beautiful; I was just trying to make him look like a woman. The other makeup artist, *George* Masters – a beauty specialist – came in and used lifts to pull up his eyebrows to give them more of an arch, which helped with both the femininity and the attractiveness. He also used very heavy makeup – greasepaint – but by then they had gotten rid of the white uniforms, so that was not a problem. However, partway into the filming, Masters was dismissed because his makeup was inconsistent; and Allen Weisinger finished the film.

Sometimes I think I should have stuck it out, or written Dustin a letter or something – for old times sake, if nothing else – but I didn't. *If* the same thing were to happen today, I would handle it differently. "Sure. Let's see what this other guy can do. Maybe he has some ideas." I'm still saddened by the way these circumstances created an impasse between Dustin and me. I hope that one day fate will bring us together, just so I can shake his hand and say: "Look, I have good feelings about so much – all of the stuff we did together. I'm really sorry that we had that misunderstanding. I don't know what was going on on your side. I only know that I feel bad about it."

For a scene in The Hunger, in which a modern-day vampire ages within minutes to 150 years old, a series of five progressive makeups was created for David Bowie. Smith performs on-set touchup work on the penultimate stage in which the character was to appear to be about ninety.

You've worked with a great many of the major actors of our time. Do you have some personal favorites?

Without question, my all-time favorite was Laurence Olivier. I first worked with him in 1959, shortly before I left NBC. *It* was a production of *The Moon and Sixpence*, and Olivier was playing the principal character who changes from a stockbroker to an artist and finally develops leprosy. I, of course, knew Olivier by reputation. I knew his love of makeup, his expertise, his perfectionism. I was scared to death.



We didn't have a lot of time in those days; so I quickly got some photographs of him and made up some sketches, just on tissue paper, of different hairstyles and beard styles and some leprosy concepts. I wanted to be prepared for him. At that

time on television, nothing remotely disgusting was permitted on the air. So, literally, I had to present a design of the leprosy makeup to the head of the continuity department – the network censor – to get his approval before I could go ahead with it. My basis for the design was the leonine type of leprosy – which is characterized by bulgy kinds of deformities – not the nasty type with all the boils and the puss. That was okay. So Olivier comes and we sit down for a conference. I show him the sketches, and he's like an enthusiastic kid: "Oh, that's wonderful. Are we going to do that? Oh, I like it." I was on a cloud.

On the television show Academy Award Showcase, Dick Smith worked again with Hal Holbrook, this time portraying Abraham Lincoln. Holbrook had performed the character on stage for years, but Smith found the challenging because of the actor's total lack of resemblance to his subject.

I've heard stories about Olivier being quite arrogant; but with me, at that time in his life, he was the soul of patience and kindness and respect. The hours back then were crazy. We were up for two days, taping all day long. There were two phases of the leprosy makeup, and the second one I finished at about 3 o'clock in the morning. Olivier got up from the barber chair and looked in the mirror, and said, "Dick, it does the acting for me." I was overwhelmed! A postscript to that came sixteen years later, on *Marathon Man*. I had just come into the rehearsal hall; and Olivier was in there talking with the director, John Schlesinger. I walked over to them; and, for a moment, Olivier didn't recognize me. Schlesinger said, "This is Dick Smith," and Olivier lit up. "Oh, Dick! I'm so glad to see you." Then he turned from me to John, and said: "You know, he did the most wonderful makeup on me. *It* did the acting for me." He quoted himself! *It* was astonishing. Olivier was truly remarkable on that film. He was in very poor health at the time, with a kind of creeping paralysis of all his muscles, and he could hardly get out of a chair. But when the cameras rolled, he did things that ought to have been impossible for him, physically. And he never complained, never asked for a break. There was absolutely no self-pity in the man.

Hal Holbrook is another great favorite of mine. I asked to meet him years ago when he was off-Broadway doing Young Mister Lincoln. I wrote him or called him, and said I had heard what a nice job he did on his makeup and could I come and watch him put it on? He was kind of embarrassed and touched at the same time. So I went one night and watched, and he was truly very skillful with highlights and shadows – very meticulous. His illusions were wonderful. We enjoyed talking about it. I even learned a couple of things. Later, I read that he was considering doing Mark Twain, Tonight! on television. He'd been doing it for years on stage, but I had never seen it. So I wrote him saying – hint, hint – that he must do it and that he should not fear that it couldn't be done successfully on television because of the need to age him. I assured him that it could be done. Of course, that led to our actually working together; and Mark Twain, Tonight! proved to be one of the best experiences of my professional life. Hal still does Twain; and he still uses my rubber noses – though he's gotten old enough in other areas that he doesn't need appliances anymore.

An equally great favorite of mine is Max von Sydow, a dear, sweet, wonderful man, tremendously cooperative and appreciative of the makeup I did for him on *The Exorcist*. We really got to know each other when we were in *Iraq* filming the opening of the picture. *It* was supposed to be a one-week shoot; but Billy Friedkin went mad with all the ambiance and the colorfulness of the scenes, and we ended up being there for six weeks or so. We lived in the railroad station hotel – the only hotel in the second largest city in *Iraq*. *It* was a bit spartan, but otherwise fine. Max and I were thrown

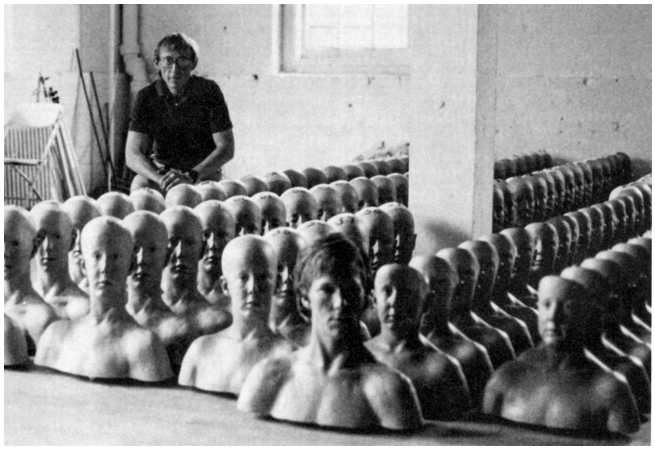
together a lot of the time. There was nothing to do in the evenings – no television – so we had philosophical discussions. We still keep in touch, although we see each other very infrequently.

Audrey Hepburn was a delight, well deserving of her reputation for being a very sweet person. Walter Matthau was great fun to work with, as was Jack Lemmon. Oddly enough, based on real-life personalities, it should have been Walter who was the finicky half of the odd couple, not Jack. I remember the first day on The Sunshine Boys. We entered his star dressing room on the lot – a perfectly lovely, clean little suite – and he proceeded to unload a couple of shopping bags filled with cleaning products. Then he sanitized the toilet, gave the white glove treatment to the shelving and flooded the room with a powerful air freshener until I was choking and protesting. I told him he'd been miscast in The Odd Couple. Then, of course, there was Marlon Brando who had a very quirky sense of humor and loved little quiet practical jokes. Marlon was a kind and generous man, and we got along wonderfully. There are so many people I've enjoyed over the years.

On location for Ghost Story, Smith readies a puppet he constructed to represent the corpse of a young woman drowned and entombed underwater for fifty years. Other puppets were made for scenes in which the woman's spirit returns in apparitional form to hasten the deaths of the men responsible for her premature demise.

How about *Robert De Niro?*

De Niro is such a perfectionist that he's not an easy guy to work with. He is such a perfectionist in terms of everything – including makeup – that I've never, before or since, had quite the difficult working relationship that I had with him. My first involvement with him was on *Godfather* II where he was playing young Don Corleone, the Brando role in the first film. *It* was a simple makeup. Basically, I just slicked his hair back and gave him a mustache. But you know how Marlon's eyebrows sometimes go up near the bridge of his nose and look kind of melancholy? I decided to do the same thing on Bobby. So I took a fine black eyebrow pencil and penciled a few hairs over his nose – just a little touch. Bobby always examined his makeup very carefully in the mirror. About the third or fourth day after I started doing this, he leaned up close to the mirror and studied it quietly for a very long time. Then he said to me: "Dick, yesterday you used fourteen strokes. Today you only used twelve." Well, I hardly knew what to say. I always thought I was a perfectionist in my work, but I felt like an amateur perfectionist compared to Bobby.



With a crew of four, Smith created more than a hundred full-size heads – each altered incrementally from the one preceding it – for an early scene in Starman in which an adolescent boy transforms into an adult via replacement animation. Though designed to be uninterrupted, the five-second shot was cut in two and abbreviated during editing.

I worked with him again on Taxi Driver. He was super-critical, but we got along all right. Then things fell apart on *The Deer Hunter*. We were in Thailand doing the Russian roulette sequence. Bobby had very specific ideas about what he wanted for his makeup – a cut over his eyebrow, a bruise here, streaks where sweat trickled through the dirt on his face. All of this I had worked out. The problem was not his makeup, but Christopher Walken's. At that point in the film, Chris' character is practically a zombie from all the drugs he's been taking and the trauma of war. I made his skin very sallow and jaundiced looking. I made him haggard and dirty – even his teeth were grungy. And, of course, he had on dirty clothes. We're on the set, and Bobby and Chris are sitting opposite each other at this little table. The lighting is very low – which makes it difficult for the yellowish makeup to register – so I'm touching up Chris. *In* order to punch up the color, I'm using bright lemon yellow greasepaint, and with a sponge am stippling little speckles of it on in order to accent certain areas of the face. As I'm doing that, Bobby leans across the table and points at one of the little dots – which happens to be two or three times larger than the other little dots, but is still less than the size of a pin – and says, "There's something wrong with the makeup." I don't mind that, really, because sometimes people have saved my life by noticing something that I didn't. But in this case, I looked at it and said: "No, that's all right. *It* won't show." And Bobby, if I remember this correctly, said: "Well, no. It's not all right. I can see it." So he calls the director, Michael Cimino, over. Of course, Michael is not going to fight with Bobby De Niro. Well, I got pissed. I was not in a patient mood that night, and I felt De Niro had no right to criticize another actor's makeup. *It* was not, in my opinion, his concern. I had had it. So I stormed off the set and left my assistant to cover for me. The next morning at the hotel, Bobby spots me in the lobby and comes over; and some words were said that I felt were insulting and impugned me as a person. So I gave a week's notice and quit the show. Everyone got very upset, but I stuck to my guns.

I don't think even Bobby understood. A year or so later, he called me about Raging Bull, and we had a frank conversation. He apologized for what had happened, and I said: "Look, I don't have any hard feelings; but I'll tell you frankly, Bobby, you're a pain in the ass to work with. I will, if you want, design the makeup for you; but I don't want to be putting it on, day after day. You'll have to get somebody else to do that – I can recommend someone." And that's the way it was left. Eventually, they got Mike Westmore to do the show; and he did a great job. For me, I just couldn't deal with it again. When I said that Bobby was a pain in the ass, it was not that he was unpleasant or impolite or anything like that. It was just that his endless scrutiny, and the feeling I got that he was never quite satisfied, took all of the joy out of it.

How hard are you on your own work?

I tend to be a very severe judge of myself. I see my own flaws and failures better than anyone. On the other hand, I think I've learned to appreciate what I do and enjoy it. Throughout my life, I've seen creative people who have lousy images, who don't appreciate their worth and can't accept that they're terrific. They can only see the flaws and the mistakes. I'm not like that. When I started out, I was a typical, self-doubting perfectionist. Nothing I did was ever good enough. The value of that, I suppose, is that it drives you to become as good as you possibly can. Now, however, I can see the good in what I do; and I'm happy with that.

When you started out in the business, you admit to knowing very little. You were pretty much self-taught on the job. Today there are quite a few makeup schools – even your own program which you've been running for a decade. *Is* it possible to produce a good makeup artist from a school?

I think, obviously, you cannot make just anybody into a makeup artist. Even talent is not enough. There has to be a real drive, which is usually caused by a great fascination and a love of makeup. *It* has to be something you want to do more than anything else in the world. And people with that drive usually manage. They may not become Rick Bakers, but they can certainly become good makeup artists. Among my students, I have seen wonderful things happen. I have students whose files will show that their sculpture was pretty wooden when they began. But gradually, over time, and with the right guidance and encouragement, it becomes better and better. I've seen kids under fifteen who sculpted so naturally and so intuitively that they were just natural-born sculptors without any lessons at all. But for the person who doesn't have that natural facility, it is possible to develop one's skills until they're very good. I myself am a perfect example of that. I had no obvious artistic talents when I was young. *In* fact, I chose originally to be a mechanical engineer, because I thought I had no artistry in me.

With sculpting, I tell people to give themselves the luxury of time. Pick a good subject and work on it. Use reference materials constantly. When you get tired, walk away from it – but don't finish it. Keep coming back to it, examine it, try different lighting, different directions in the mirror. If you really push, you can raise yourself to a higher plateau. I think I did that to myself on *Little Big Man*. I sculpted seven weeks on that old-age makeup. I examined photographs, pictures, everything. Every wrinkle had some reference. If something was not right, I would do it over – and I did things over a lot. But the end result was worth it.

For someone who almost became a mechanical engineer, it's somewhat surprising that you never embraced the kinds of animatronic effects that have swept the makeup effects field. Did the prospect of trying to run a major animatronics show out of your basement in Larchmont have something to do with that?

That was certainly part of it. There just wasn't the room. I checked out setting up a large shop in that area years ago and found there were just not the facilities around that you can find all over in Hollywood. The best I could locate was a dirty old garage – and very expensive. Space you could get for two or three dollars a square foot in L.A. would cost ten in New York. Then there was the fact that there were hardly any experienced mechanical effects guys in the New York area. I did some mechanical things on *The Hunger* that I was very happy with, though the director didn't use them. And I did a few others for a dumb movie called Spasms. So I found I could do it – at least on the more simple things. I suppose if I had gotten hold of a mechanical whiz, I could have done a lot more – but it was never really my interest. The younger guys can make their mark in that area.

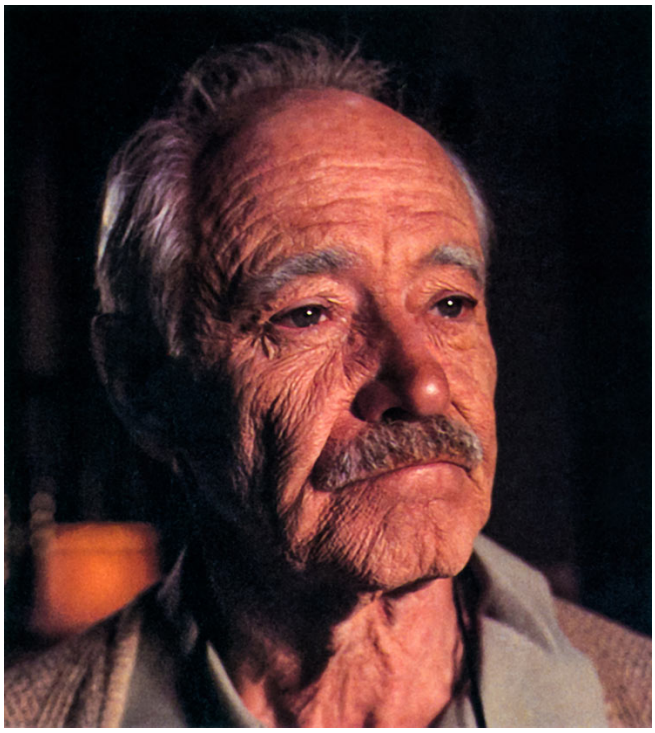
Over the years, I'm sure there are projects you would have loved to have done, but did not…

I can think of one immediately. *The Elephant Man*. I had run across an illustrated book on the subject way before it was considered as a film – I guess as a result of the Broadway play, which, of course, had no makeup in it. And I salivated over the thought of doing that makeup. When I heard it was going to be done in England, I knew I wouldn't get the chance; but I kept in touch with my friend, Chris Tucker, who eventually did get to do it – although it turned out to be a real rush job. *It* seems

that the director, David Lynch, wanted to do it himself! He had only done one other film at the time – *Eraserhead* – which had some kind of queer little creature that he made in it. Based on that experience, he planned to do the *Elephant Man* makeup. And apparently he did come up with something; but an acquaintance of Chris' who saw it described it as absolutely immovable. So two or three weeks before they were supposed to start filming, Lynch and the producer came to Chris' shop in London and practically got down on their knees on the lab floor and begged him to save their asses. And he did. But that was a project I would have loved to have done. Not that I could have done it any better than Chris – he did an excellent job. The only thing that seemed improvable to me was that it took something like seven hours to put on. But since it was done under pressure and in a rush, that kind of problem was not considered top priority.

After fifty years in the business, have you any career goals you've yet to fulfill?

There are certainly things I would still like to do. I would like, for example, to do one last extreme old-age makeup – really unbelievably old. And I would love to do it with translucent materials and gel-filled appliances. Over the years, makeup artists have done miracles with foam latex, but I think we've gone about as far as we can with it. The skill that it takes to make foam latex – to sculpt it and paint it and make it look believable – takes absolutely top work. And even at its best, it won't fool someone in person. You make up an actor and stand him in front of the director, and too often the director doesn't like what he's seeing because it doesn't look like real skin. Foam latex just doesn't have the translucency. It may look just fine on film, but the bias against it is already there. I've heard many stories of directors and producers deciding against foam latex appliances – mainly with aging makeups – and choosing instead to use old-age stipple which they feel is safer.



A test photograph of Jack Lemmon in old-age makeup for Dad. In the movie, the actor would be essentially bald on top because an electric shaver, intended to maintain his meticulously thinned hair, instead cut it off. Smith received his second Academy Award nomination for the film.

For the last three years, I have been talking up gel-filled appliances as the next big advance in makeup. I've even gone out to different shops and talked about it and shown samples. Everyone raves about it. With translucent materials such as these, makeups can advance to a whole new level of believability. Foam latex will still have a place, mind you. It's cheaper and quicker and easier for most people to do. But the opportunities for something new and better are endless. Can you imagine an

extreme old-age makeup where you can really see the weight of thin, transparent skin and tired old flesh that has lost its memory, moving realistically as the actor moves? *It* could lend a quality to old-age makeups unlike anything that has ever been done before. And with it will come all new sets of rules. There will not, for example, be the shrinkage there is with foam latex, so there will be no need for overlapping appliances. *Instead* of overlapping the appliances, one could butt two thick edges together and then just cover the crack.

Smith's Jacob's Ladder effect was presented for Peter Jackson's Heavenly Creatures at the Montreal Academy of Time-lapse photography to record the melting of a wax or gelatin head.

At the moment, Gordon Smith – who did Jacob's Ladder and a number of Oliver Stone's films – seems to be at the head of the pack. He doesn't use any foam latex – only all translucent materials. The replica he made of Kennedy for JFK – the corpse – was so realistic they had trouble getting it through customs. Recently, Gordon has done the first, perhaps landmark, makeup using silicone gel-filled appliances for *Legends* of the Fall – for scenes of the old *Indian* who introduces the story. The makeup itself was quite extraordinary, but the lighting and camera angle in the film did not show it to its best advantage. There's going to be a lot more of that type of work, and the prospect is very exciting. We're on the verge of a whole new era in character makeup.

Are you bullish on current trends in the field?

For the most part, yes. But I do have some concerns. Everyone knows my feelings about openness. Secrecy has always bugged me. When I was starting out, nobody would tell me anything – and I vowed never to be that way. As head of the makeup department at NBC, part of my job was to train new staff members – and I never held things back as some department heads used to do. What was the point? I was learning so quickly and things were changing so fast that the greatest innovations one year might well be passé the next. So why not pass them on and help others struggling to learn the profession? As my influence broadened, it was that kind of thinking that I tried to instill in young people starting out – and for quite a few years, there was a lot of sharing and exchange of information.

Today I see signs of secrecy creeping back in. I don't blame people personally for this. It's a function of the way the business has changed. We're no longer a little band of brothers, with small shops here and there in basements and that sort of thing. Today we have these big factory-like businesses where the investments are considerable and the competition is fierce. People and companies doing experimental work are now hesitant to reveal what they've learned – at least until they've had a chance to see it through and use it in a film. That's disappointing in a way, but also understandable. Who can blame anyone for wanting to protect an advantage that might make them more salable than the next guy? But what this practice tends to do is slow the dissemination of new information, thereby slowing growth in our profession as a whole.

How would Dick Smith like to be remembered?

Certainly as an artist with a deep and all-abiding love for makeup. I have been unchanged in that regard for fifty years. Makeup has been my life. *It* has rewarded me enormously in all kinds of ways and I still love it with all my heart. That love for makeup extends also to a love of makeup artists. There has always been, for me, a strong sense of connection and comradeship with others in the

field. So to narrow it down, I guess Dick Smith would like to be remembered as a man who loved his art and loved his colleagues.

1945

Having abandoned his studies at Yale to pursue a career in makeup, Richard Emerson Smith landed his first job in the entertainment business. Though he had no professional experience, and his knowledge of makeup was limited to what he had learned through primitive experimentation and by studying a mediocre textbook he had unearthed, Smith was nonetheless named the first staff makeup artist at NBC Television in New York. Television was in its infancy at the time, and the nascent network – operating out of a single small studio in the radio-dominated RCA Building – was on the air for only a few evening hours several times a week.

Smith spent his early months at the network in self-instructed on-the-job training, trying desperately to keep up with day-to-day work while learning the essentials of his craft. Television was a live medium then; and though most of his assignments required traditional beauty makeup rather than character makeups – his principal interest – Smith had his hands full. With the exception of a couple of makeups he had undertaken on his acquiescent mother, Smith had previously used himself almost exclusively as a subject. One of his immediate requirements, therefore, was to master the art of making up women – no small task since the black-and-white television cameras of the day had very strange response to color, turning most red tones a ghastly white.

1946

February of each year typically had at least one television drama centered on some aspect of Abraham Lincoln's life. For Abe Lincoln in *Illinois*, his first opportunity to transform an actor into the sixteenth president, Smith decided to do an appliance makeup on Stephen Courtleigh, even though he knew virtually nothing about the process. Having observed mold-making and slush-casting techniques during a six-month stint of employment at the American Museum of Natural History, Smith attempted to apply his limited knowledge of the subject to produce a more accurate likeness of Lincoln than would otherwise have been possible. He began by taking a lifecast of Courtleigh and then sculpting the additive features in clay. Next he made a plaster mold of the sculpture. The only latex available after World War II was synthetic; and when Smith slushed it into his molds, the resulting appliances came out hard as rock. He used them, nonetheless – for dress rehearsal – only to discover that when he attempted to blend and color them, the theatrical greasepaint he routinely employed soaked into the rubber and turned powdery white. Working in a vacuum – without benefit of information from other makeup artists – Smith did not realize that there was an existing product specifically designed to color latex masks and appliances. Consequently, he had to abandon his approach altogether and model Lincolnesque cheekbones and nose on the actor with mortician's wax.

Quick-change makeups were often required on live television, and Smith was ever-alert to new techniques that would hasten the process. When a fellow makeup artist shared with him the fact that K-Y lubricant could be mixed with black watercolor to make a water-soluble dirt application that could be removed quickly with a wet cloth, Smith seized on the idea and was soon extrapolating it to simulate stubble beards, bruises and black eyes, even cuts and blood. On a

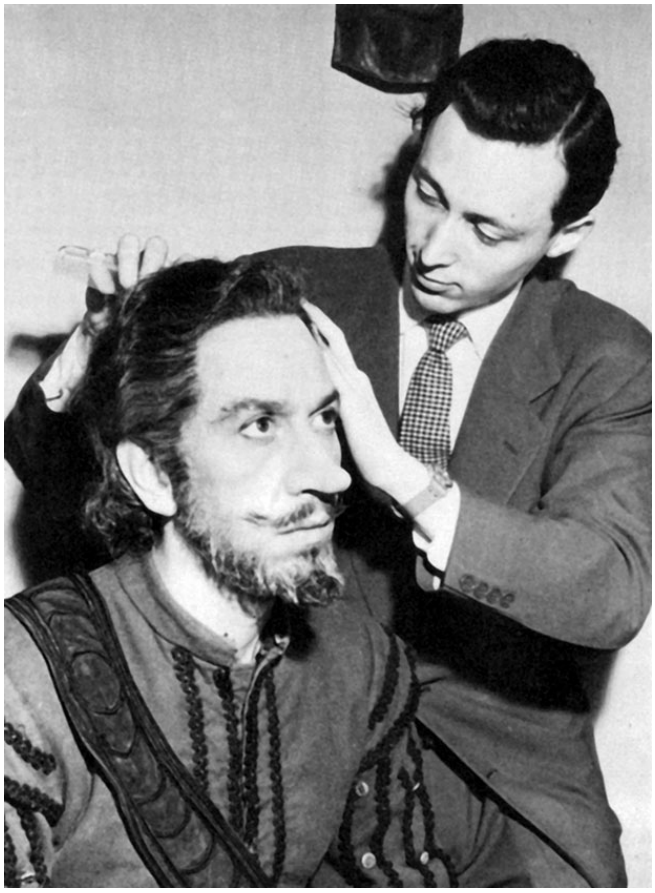
production of *Blithe Spirit* – the Noel Coward farce about a writer tormented by his late wives – Smith took the concept a step further by using a water-soluble makeup to hide a waterproof makeup underneath. *In* that way, one of the wives, played by Carol Goodner, was able to appear alive in one scene and then dead in the next simply by swabbing away her fleshtone makeup to reveal a ghostly pale makeup beneath.

Stylized animal masks created by Smith for The Last War were ruined when surface netting had to be removed due to insufficient lighting. / Edgar Stehli, Bobby Clark and David Wayne – in latex masks and rubber kitchen gloves – as the oracle witches in Macbeth. / Smith prepares Jose Ferrer for his role in Cyrano de Bergerac.

Another project – one that afforded Smith an opportunity to exercise his creative muscles – was The Last War. Set in the aftermath of a nuclear holocaust that has left most of the planet a lifeless wasteland, the production was a dramatic allegory postulating a scenario in which a handful of animals place the world's sole surviving human – as a representative of his species – on trial for crimes against nature. The animals would be portrayed by actors in makeup. At the time, Smith's ability to effect major facial alterations was limited to the making of slip-cast rubber masks – which were hardly conducive to eliciting performances from actors. So he decided upon a different approach altogether. With heavy copper wire and a soldering gun, Smith built stylized wire-frame masks for each of the animal characters, then covered them over with fishnet that allowed the actors' faces to be seen within. *It* was not until dress rehearsal – the day before the broadcast – that anyone realized there was insufficient light on the tiny stage to penetrate the masks and reveal the performers. Additional lighting units would have exceeded the budget, so director Fred Coe ordered Smith to cut the fishnet off the masks. Without the netting to define the planar surfaces, most of the animal faces looked like nothing more than masses of twisted wire.

1947

Highlights for the year – requiring nothing extraordinary in the way of character makeups – were Angel Street with Judith Evelyn and Walter Abel, and homages to Shakespeare in the form of *Twelfth Night* and Othello. *In* the title role of the latter was Michael MacLiammoir – who would later play *Iago* in the Orson Welles film – whom Smith made up routinely with traditional darkened face and a crepe beard. On stage and off, the actor wore what Smith considered to be a rather obvious hairpiece – which would normally have been removed prior to affixing the wig that was to complete the trans-ethnic makeover – but as the actor seemed disinclined to acknowledge its existence, Smith opted to do likewise and simply planted the wig on top of the toupee.



1948

Early live television attracted a wealth of young talent, including many writers and directors and actors who would become household names as the medium matured and its more skillful practitioners moved on into movies. *It* also drew – perhaps because of its penchant for doing the classics – an astonishing roster of Broadway and Hollywood actors who embraced the fledgling medium and participated with considerable regularity.

Smith got to work with two of Broadway's biggest stars when Gertrude Lawrence appeared as the enlightened empress of Russia in Catherine the Great and Dennis King assumed the role of the miserly Ebenezer Scrooge in *A Christmas Carol*. King, who had a good face for makeups and loved wigs and rubber noses, was a personal favorite. Other productions for the year included The Late *George* Appley, with Leo G. Carroll, and an encore presentation of Angel Street, this time starring Betty Field. Smith especially enjoyed a production of Macbeth – with Walter Hampden in the lead – for the opportunity it afforded him to create whimsical masks for the three oracle witches. For comedian Bobby Clark – whose trademark was glasses drawn around his eyes with greasepaint – Smith designed a mask with bony protuberances that fittingly incorporated dark sunglass lenses. Another of the witches, played by David Wayne, became a one-eyed creature with a single tooth.

1949

Smith worked again with Dennis King, using minimal makeup to prepare him for his title role in Napoleon. Smith also made a small, but ever so crucial, contribution to a televised adaptation of Cyrano de Bergerac, producing an elongated latex nose for Jose Ferrer who was then winning kudos for the role on Broadway. For a production of *The Man on Half Moon Street* – a melodrama about a homicidal doctor who discovers he can perpetuate his youth with glandular secretions extracted from his victims – Smith produced his first full mask for actor John Newland who had to undergo a quick-change transformation to old age. Accustomed to doing character makeups on actors using highlights and shadows, Smith did the same with the mask, darkening every crease and fold in the latex – which he found, too late, looked dreadful on camera. *It* was a mistake he would not repeat. Late in the year, Smith assumed makeup chores for The Milton Berle Show – a weekly comedy-variety program that was to change the face of television and create its first certifiable star.

Also begun that year was a weekly anthology, Believe *It* or Not, based on stories taken from the famous newspaper feature by cartoonist *Robert* L. Ripley. For one of the episodes, Smith constructed his first full-size human puppet. The tale involved a married woman whose infatuation with a ventriloquist takes a bizarre twist when her husband bursts in on them and shoots the man. Only then is it revealed that the supposed ventriloquist is, in fact, the dummy and the real ventriloquist is a midget sitting on its lap. For most of the show, the man-size dummy was played by Nicholas Saunders; but for the climax, a replica was needed so that it could be shot in the head. From a lifecast of the actor, Smith fashioned two hollow wax heads – one for the dress rehearsal and one for the production – and fitted them onto a clothing mannequin. Since there were no special effects people on staff, the director brought in a sharpshooter with a rifle whose job it was to actually fire into the dummy head – mere inches above the midget actor. Safety issues aside, Smith worried that a real bullet, rather than shattering the wax head, would simply pass through it – which indeed proved to be the case during the rehearsal. The marksman felt that by notching his next bullet, the desired result would be achieved for the live telecast. As a contingency, however, the director positioned a prop man just off camera with a hammer. If the bullet failed to shatter the head, he would cut to a reaction shot and the man could step in and deliver the decisive blow. What everyone failed to realize, however, was that there was a wall mirror behind the actors which clearly revealed the dummy on the opposite side of the room. So during the telecast, when the bullet again failed to do its job, audiences were treated to a reaction shot of the actors that also revealed, in reflection, a prop man hurrying in and smashing the dummy to bits.

1950

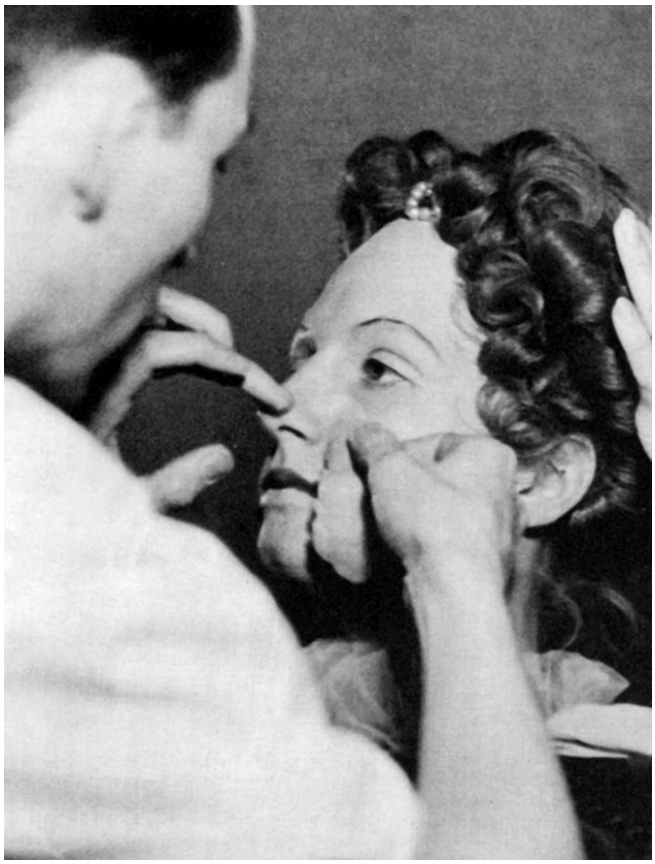
As the popularity of television grew and programming hours increased, so did the size of the makeup department. By the end of his first five years at the network, Smith was supervising a staff of twenty makeup artists and hairdressers, most of whom he trained as well. Operas were becoming television fare – a welcome development for the makeup department as they were generally lavish productions. Among the earliest was *Tales of Hoffmann*. Other highlights of the year included Van Gogh, in which Everett Sloane played the brilliant, but tortured artist. The actor had recently undergone plastic surgery to reduce the size of his nose, but was distressed because he felt that too much of it had been removed. For the production, Smith fashioned a simple aquiline nose to heighten Sloane's resemblance to the painter; and the actor was so pleased with it that, after the show, he asked if he could take it to his surgeon to have his own nose redone just like it. Finishing out the year was another seasonal production of *A Christmas Carol*,

starring as Scrooge a terrified Ralph Richardson in his first television appearance.

Smith made a rubber head of Douglas Saunders and placed it on a mannequin body for an episode of Believe It or Not.

1951

In live television, it was often necessary to effect major makeup transformations during commercial breaks lasting only a minute or two. Such was the case with Of Famous Memory, in which Nancy Marchand portrayed Elizabeth I from young princess to aged matriarch. To simulate the distinctive receding hairline Elizabeth had in her later years, Smith made a rubber forehead that concealed Marchand's own hairline, then covered it with a hairpiece for her younger scenes. During the quick-change transformation to old age, all that was needed was to loosen a few hairpins and slide the wig back a couple of inches to reveal the higher forehead. Also needed were jowl appliances. Though not yet versed in foam latex, Smith had discovered hot-melt vinyl which he could melt down to a sticky consistency and then brush into a single-piece mold. To remove rough spots and thin out the edges, he used wood-burning tools on a low setting to melt the vinyl without scorching it. Attaching the appliances proved difficult since the hot-melt secreted plasticizers which rendered it quite slippery. Smith finally discovered a medical adhesive that was extreme sticky – and difficult to remove. During the dress rehearsal – in haste – Smith used an adhesive remover he had bought at a drugstore, only to find that it burned the actress' skin. *It* was the only time he had ever injured a performer; and he vowed never again to use a product without thoroughly testing it first.



Smith applies hot-melt vinyl appliances to Nancy Marchand for her role as Elizabeth I in Of Famous Memory.

Hot-melt appliances gave Smith one of his worst professional scares when he was called upon to make up Vaughn Taylor as an old codger for The Fast Dollar. Smith attached heavy jowls, a double chin, a lower lip piece, a nose and some eye bags – all made out of hot-melt vinyl – to the veteran character actor's face. During the live production, Smith noticed that the chin piece was beginning to loosen. A short break afforded him time to rush Taylor to the makeup room. When the chin piece was removed, water poured out from beneath the hot-melt cheeks. Taylor had been performing vigorously under the hot lights; and sweat had accumulated under the plastic appliances. Smith dried the area as best he could with a hair dryer and reapplied the chin, getting the performer back on set with only seconds to spare. Another strenuous scene followed – during which Smith, too, sweated profusely, envisioning his appliances dropping off in front of millions of viewers. Miraculously, the makeup held – but there would be no more hot-melt appliances for Dick Smith.

Winifred Heidt as a grotesque crone in the opera Pique Dame.

1952

For a television adaptation of Pique Dame – a Tchaikovsky opera known also as The *Queen* of Spades – opera diva Winifred Heidt starred as a countess who sells her soul to the devil in return for mastery at cards. Near the end, she is revealed as a grotesque, bald-headed crone. Assured by the director that the makeup would be prominently featured, Smith labored to produce an elaborately detailed latex mask – puffy and wrinkled – which he applied to the actress with exceptional care. When the producer saw it, however, he found the makeup so repulsive that he refused to let it be shown in closeup.

For Brat Farrar, Smith was tasked with making actors *Robert* Pastene and Richard Derr look like identical twins – an essentially impossible assignment given the technology and materials of the day. Nonetheless, he did his best, sculpting a composite character whose features were somewhat compatible with both actors, then making molds and producing pieces using a press-out polyvinyl plastic then in vogue among Hollywood makeup artists. Though translucent and easy to blend – edges could be dissolved simply with alcohol – the material was not elastic enough to be used around the mouth.

Jimmy Durante – whose oversize nose was his stock in trade – was given an even larger one for a variety show skit parodying Cyrano de Bergerac. Smith fashioned several out of slush-molded latex – one of which, a burlesque of the comedian's own nose, was ultimately selected. Upon discovering

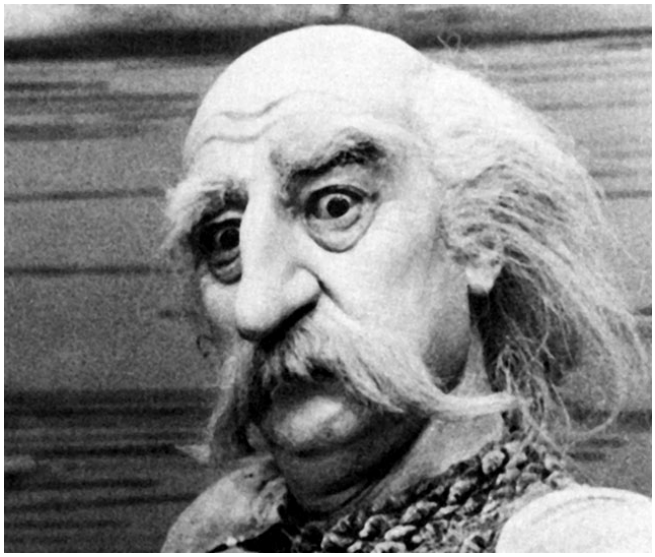
that Durante could not tolerate the smell of latex, Smith solved the problem by gluing a piece of cotton into the hollow nose tip and saturating it with cologne.

1953

The year offered little in the way of character makeups, but Smith enjoyed working on a number of important productions, including the now-classic Paddy Chayefsky teleplay, Marty, in which Rod Steiger played a good-natured, but socially inept butcher trying to find happiness in the Bronx. Smith also made up Mary Martin and Ethel Merman for The Ford 50th Anniversary Show, a star-strewn salute to the Ford Motor Company in its golden anniversary year.

To Live in Peace – a drama with Ann Bancroft – was significant for Smith in that it marked his first involvement in color broadcasting. Color demanded altogether new approaches to makeup. Products effective in black-and-white were no longer usable; and even those employed in the theater and in color motion pictures were unsatisfactory because color video cameras of the day emphasized warm tones dramatically. As a result, normally healthy complexions had to be rendered pallid to read properly on television. Since there were no commercially available makeup products suited to the task, Smith responded to the challenge by melting down and mixing various shades of panstick to get the colors he required, then poured them back into their original containers. After considerable refinement, he graded them in twelve different shades that were subsequently manufactured by Max Factor and became industry standard. Later advances in color television technology required Smith to develop a second and third series of complementary makeups.

Smith used foam latex appliances for the first time in a production of Alice in Wonderland. Mort Marshall as the Mad Hatter, Reginald Gardiner as the White Knight and Bobby Clark as the Duchess.



Smith used foam latex appliances for the first time in a production of Alice in Wonderland. Mort Marshall as the Mad Hatter, Reginald Gardiner as the White Knight and Bobby Clark as the Duchess.

1954

Smith learned to assume nothing during a lavish production of Macbeth starring Maurice Evans and Judith Anderson. After the routine dress rehearsal, director *George* Schaefer indicated that he wanted the sergeant who opens the second scene to have wounds befitting his return from combat. Smith – who was busy with the principal performers – assigned the task to one of his relatively inexperienced assistants. An hour or more later, when the actor had not yet returned, Smith sought him out and found him still in the makeup chair, every bit of bare skin covered with simulated cuts and bruises. With no time left to remove the makeup and start again, there was no recourse but to send the man before the cameras looking more dead than alive.

Smith used foam latex appliances for the first time in a production of Alice in Wonderland. Mort Marshall as the Mad Hatter, Reginald Gardiner as the White Knight and Bobby Clark as the Duchess.

1955

A major effort for the year was The Four Poster – a two-character play in which a couple advance through thirty-five years of married life. For this quick-change production, Smith discovered he could gray the hair of Hume Cronyn and Jessica Tandy in mere seconds by formulating pancake makeup in a gray-hair color and then applying it in broad strokes with a baby's hairbrush dipped in water. Facial highlights could be added or changed with equal speed by cutting sponges to the precise shape of the desired alteration so that color could be applied with a single dab. Other productions of note included a color reprise of Cyrano de Bergerac – again with Jose Ferrer – and *Darkness at Noon* with Lee J. Cobb.

Most significant for Smith, however, was a big production of *Alice in Wonderland* that marked his first employment of foam latex appliances. George Bau – an innovator in the field and one of the few Hollywood makeup artists to embrace Smith as a colleague – had come to New York late the previous year and demonstrated how to run his particular formulation of foam latex. Smith experimented diligently for months before applying what he had learned – in a big way – on *Alice in Wonderland*. With designs reminiscent of the illustrations in various editions of Lewis Carroll's timeless classic, Smith created a wealth of appliances that transformed an all-star cast into such familiar fantasy icons as the Mad Hatter and March Hare, the Mock Turtle and Caterpillar, the Cheshire Cat and the King and *Queen* of Hearts. Later in the year, Smith made further use of foam latex in creating a family of devils for Griffelkin, a comic opera written expressly for television.

1956

Color continued to impact significantly on television. RCA – the parent company of NBC – was in heated competition with other industry innovators to prove the superiority of its latest color broadcasting systems. As a consequence, vast resources were being funneled into programming. Extravagant specials were produced on a grand scale – with four days of complete dress rehearsals, makeup included, becoming the norm as cast and crew performed to exhaustion while technicians tinkered with vast lighting systems and other color essentials.

Smith created a family of devils for the comic opera Griffelkin.

The year was a busy one for Smith, though the slate offered little in the way of challenging character makeups. Opera continued to be a prestigious staple, with the network engaging opera star Leontyne Price for productions of *The Magic Flute* and *La Bohéme*. The casting of a black woman in lead roles traditionally sung by whites was, for the time, a controversial and somewhat courageous move on the part of the network – which nonetheless hedged a bit by asking Smith to apply makeup that lightened Price's medium-black coloration. Other operatic productions included Madame Butterfly and Amahl and the Night Visitors.

A foam latex mask on a double for Claire Bloom as the elderly Queen Victoria in Victoria Regina.

Television dramas continued to draw major acting talent. Smith had the opportunity to work that year with Broadway giants Helen Hayes in Happy Birthday and Catherine Cornell in *The Barretts of Wimpole Street*. The challenge with Cornell, then in her late fifties, was making her up to play Elizabeth Barrett at age twenty. Maurice Evans appeared in productions of *The Taming of the Shrew* and Man and *Superman*; and Mary Martin played leads in *Born Yesterday* and her signature *Peter Pan*. For Smith, the principal pleasure of the latter was putting Captain Hook's pirate gang in clown makeup, with bright colors and funny noses. Smith also made up Cedric Hardwicke and Claire Bloom in Caesar and *Cleopatra*, and had the occasion to work with one of Hollywood's biggest stars, Greer Garson, in a televised presentation of The Little Foxes. Other notable productions for the year included Dodsworth and Jack and the Beanstalk. The workload and pace were murderous – but in terms of the learning experience, Smith later came to appreciate, a decade of live television was worth a career in movies or the theater.

1957

Smith elevated quick-change makeup to an art form with Victoria Regina, in which he was called upon to progressively age Claire Bloom – then twenty-six – from a young woman in her twenties to an elderly dowager of eighty. During the first commercial break – only slightly more than three minutes – the queen had to be recostumed and coifed and transformed from her svelte twenties to her overweight forties. From past experience, Smith had come to realize that in the panic to get everything done, often he would not use all the time available to him. So on Victoria Regina, he timed the procedure down to the second and had an assistant with a stopwatch cueing each step. To insure that essential materials were conveniently within reach, Smith and assistant Bob O'Bradovich put everything they would need into trays of the sort then worn by cigarette girls. Thus equipped – and stationed on either side of the actress – they quickly applied and stipple-blended a

foam rubber nose, a double chin and a jowl piece that fattened both sides of her face. Because the next change occurred within the act, Smith and crew had only slightly more than a minute to effect the transition from age forty to sixty by applying eyelids and eye bags and a lower lip and chin piece. Forehead wrinkles were added with what was essentially a rubber stamp. The final eighty-year-old makeup – required for a brief closing scene – was considerably less hectic. Since the queen had no dialogue in the scene, Smith was able to use a stand-in for Bloom and make her up well in advance.

Other lavish productions included Mayerling – a tale of doomed lovers starring then husband and wife Mel Ferrer and Audrey Hepburn – operatic presentations of Rigoletto and War and Peace, and an adaptation of *Pinocchio* with Mickey Rooney. Samuel Johnson – a dramatized biography of the famed lexicographer and poet – presented Smith with one of his more unusual challenges for the year. *In* a casting coup, the network had managed to sign Peter Ustinov for the lead. Unlike his cleanshaven subject, however, the actor sported a full beard; and for a one-night stand on television, he would not entertain the notion of shaving it. *In* researching Johnson, Smith had come across political cartoons of the day that caricatured the large, jowly man with rude likenesses that were pointedly porcine. Securing approval to impart a somewhat similar look to the makeup, Smith met with the actor and made a lifemask of him after first soaking his beard and mustache with spirit gum and pressing them flat against his face. Then, in a stylized manner, Smith sculpted exaggerated jowls and a double chin to hide the beard, plus a puffy upper lip to conceal the mustache. For the performance, Ustinov's beard was again plastered down and the appliances glued on top.

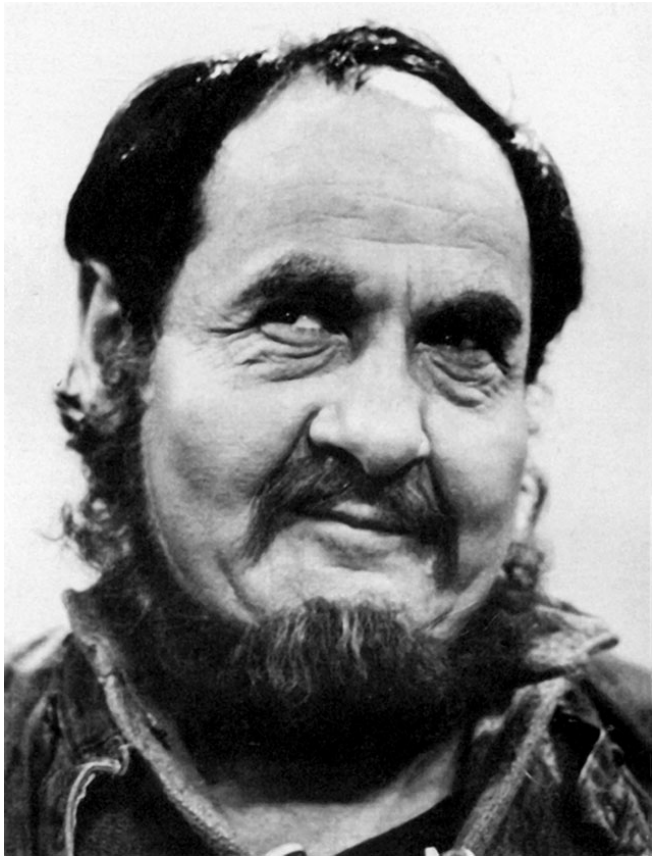
1958

The year was one of predominantly straight makeup assignments for Smith, though he did get to make up Hans Conried as a comic witch with a big nose and chin for *Hansel and Gretel*. Another memorable production was Hans Brinker – starring Tab Hunter and Basil Rathbone – with actual ice skating scenes shot on real ice inside the studio. Other shows included *Little Moon of Alban* with Julie Harris and Dial M for Murder with Maurice Evans. To promote the work being done within his department, Smith assembled a large exhibit of masks and makeup paraphernalia that was placed on display and seen by thousands of people on the NBC studio tour. Also that year, for an unusual photo spread in Charm magazine, Smith employed stock appliances to transform teenage starlet Carol Lynley into a withered old woman.

1959

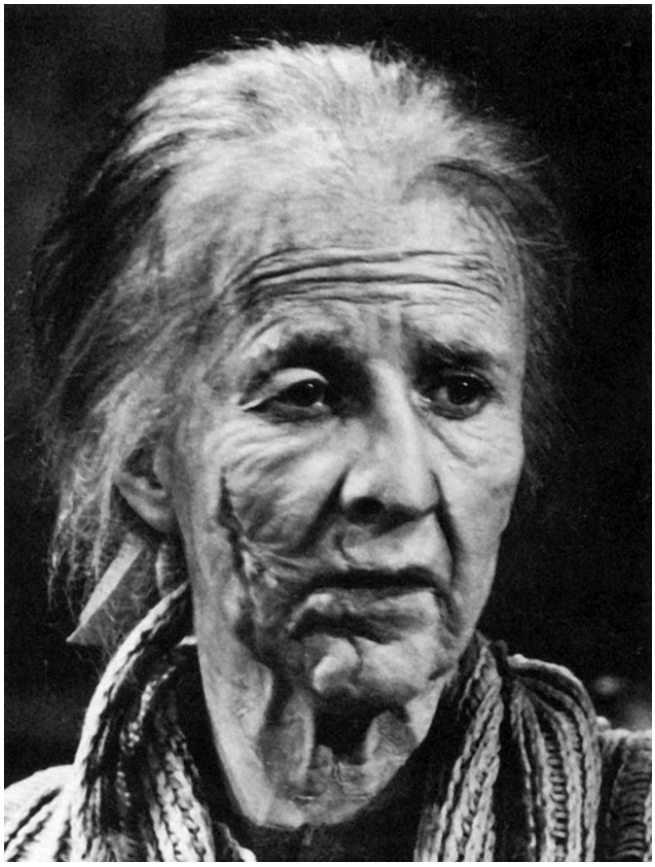
Live television was being supplanted by videotape. Although the attendant capability to reshoot scenes eliminated the occasional on-air disaster, productions became even more grueling for actors and crew as taping sessions customarily took three or four days of oftentimes around-the-clock work. Smith took to keeping an air mattress at the studio and napping for an hour or so whenever his hectic schedule allowed. During the taping of Don Quixote – starring Lee J. Cobb and Eli Wallach – a late-night shoot of Sancho Panza attempting to load *Quixote* onto a donkey was repeatedly thwarted when the animal buckled its knees and collapsed. When the trainer explained it was past the animal's bedtime, the beast was released for the night and performed perfectly the next morning. Such consideration generally did not extend to the humans involved. Smith made Wallach

into a wonderfully fat Sancho Panza for the show, but Cobb – in the Don Quixote role – refused to wear anything beyond a goatee and mustache.



Smith made Eli Wallach into a chubby Sancho Panza for Don Quixote.

The year was a prestigious one, with *Body and Soul* Medea, *The Bells of St. Mary* and Miracle on 34th Street affording Smith fine opportunities to create varied makeups for actors such as Judith Anderson, Claudette Colbert, Ben Gazzara and Ed Wynn. But the high point of the year was The Moon and Sixpence starring Laurence Olivier as an aging stockbroker who deserts his family to pursue an artistic career. *In* the course of the drama, the character becomes afflicted with leprosy; and it was up to Smith to design a prosthetic makeup that would depict the full horror of the condition without running afoul of the network censors. *In* researching various forms of the degenerative disease, Smith found one that he felt would convey pathos and nobility rather than revulsion. After clearing the concept, he worked closely with the actor – a devotee of makeup – to develop it in two stages using foam-latex appliances.



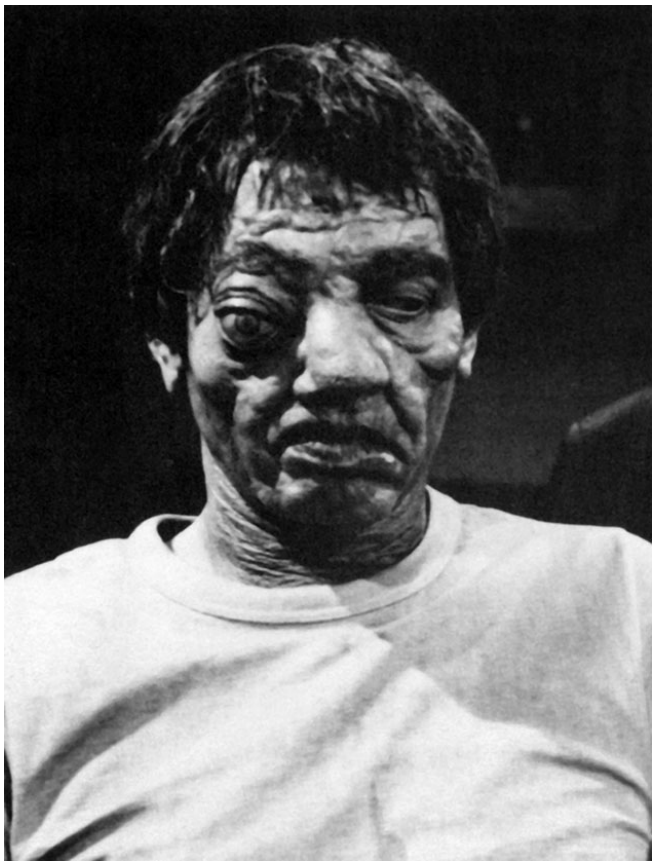
Julie Harris as a woman disfigured in an accident in Ethan Frome.

1960

Smith closed out a chapter of his life with The Devil and Daniel Webster, a courtroom melodrama in which the noted statesman and orator, played by Edward G. Robinson, challenges the devil on behalf of a farmer trying to renege on a bargain he had made to exchange his soul for seven years of prosperity. Smith – whose fascination with monster makeups had remained essentially untapped in television – was able to indulge a bit by creating a jury of the damned comprised of rotting corpses and creepy creatures.

After nearly fifteen years at NBC, Smith left the network to pursue other options. His first motion picture job on Misty – a story of two orphans and their love for a wild horse – would be calamitous. On location in Maryland, Smith climbed into the back of a truck to retrieve his makeup kits and, in jumping off, caught his wedding band on a railing and tore most of the skin off the ring finger on his left hand. Gangrene developed after a week and the finger had to be amputated. A skilled plastic surgeon removed the bone all the way to his wrist, closing and narrowing the hand so that it looked aesthetically correct, even with one less digit. The makeup artist philosophically refers to it as his 'Mickey Mouse' hand. Years later, when Jim Henson was producing The *Dark Crystal* – which had some three-fingered puppet characters – Smith complied with pleasure to a request that his hand be photographed for reference purposes.

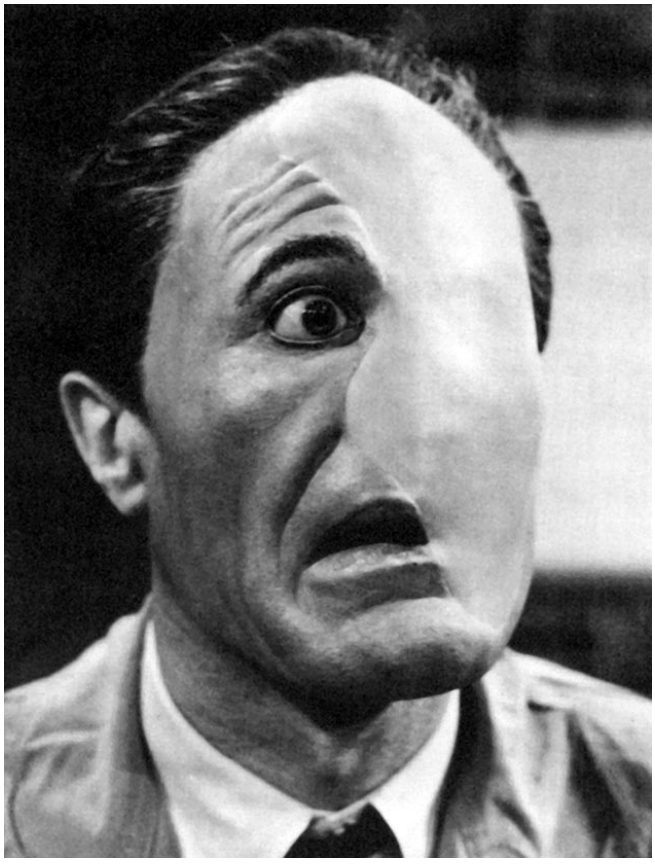
Though full recovery would take half a year, Smith was back to work in about a month, having accepted a choice position at Talent Associates, an independent company formed by David Susskind to provide quality programming for television. One of his first assignments there was to produce complete foam latex makeups for Sterling Hayden and Julie Harris as star-crossed lovers crippled and disfigured in an accident in Ethan Frome. Typical of the shooting days was one in which the actors had to remain in makeup for nearly twenty-four hours while technicians wrestled with the problem of how to keep a simulated snowstorm outside a country store set which had to remain roofless because of lighting requirements. Other prestige productions included The Datchet Diamonds with Rex Harrison, Ninotchka with Maria Schell and Mrs. Miniver with Maureen O'Hara. Filling out the year were *Valley of Decision*, *Arrowsmith and Treasure Island*, plus a trio of classic swashbucklers. The *Three Musketeers* had Maximilian Schell as D'Artagnon pitted against Vincent Price as the scheming Cardinal Richelieu. *The Prisoner of Zenda* starred Christopher Plummer in the dual role of look-alike king and commoner. And *The Scarlet Pimpernel* featured Michael Rennie in a flamboyant role that required three character makeups, including that of an old woman.



For the Way Out series, Smith made up Alfred Ryder as a stage actor playing Quasimodo.

1961

After innumerable Abraham Lincoln makeups during his tenure at NBC, Smith got to do one of his best – in terms of likeness – for The Lincoln Murder Case, primarily because actor Drummond Erskine had features that were ideally suited to the makeover. Other noteworthy productions for the year included The Heiress with Julie Harris and Jane Eyre with Sally Ann Howes and Zackary Scott. At the top of the list, however, was The Power and the *Glory*, Smith's second opportunity to work with Laurence Olivier. For his role as a dissolute Mexican priest pursued by a police lieutenant determined to kill him, Olivier wanted Smith to devise a suitably ethnic makeup. Smith complied by broadening his nose a



bit and altering his eyes to make them look slightly oriental. Then, in response to the actor's request for somewhat fuller lips, Smith produced his first lip appliances which he attached – with grave concern about whether they would stay on – using spirit gum. Smith felt especially certain that they would not survive a scene in which the fugitive priest had to ravenously consume a chicken leg; but they did – for five or six takes – thanks to Olivier's solicitous protection of the makeup.

In another episode, he erased two-thirds of Barry Morse's face with an elaborate mask.

In response to *The Twilight Zone*, then in its second successful season, David Susskind created *Way Out*, a weekly anthology of macabre tales hosted by Roald Dahl. Though the show had only a four-month run, Smith contributed significantly to three episodes. The first, False Face, was about a stage actor, played by Alfred Ryder, whose quest for the ultimate *Quasimodo* makeup leads him to duplicate the face of a horribly disfigured street derelict. After a triumphant performance, the actor discovers that the makeup is permanently affixed – and that the derelict now has his face. Smith had to produce two identical makeups: one for the derelict and one for the actor in makeup. Since both the Lon Chaney and Charles Laughton depictions of *Quasimodo* had included a grotesque eye, Smith decided to continue the tradition, taking it a step further by researching a disease that can literally push an eyeball out of its socket. Smith also incorporated elements from his earlier research into leprosy. The second episode, Side Show, required Smith only to create a severed head representing actress Margaret Philips who was playing a headless carnival freak in the show. The third, Soft Focus, featured Barry Morse as a photographer who discovers a magic retouching fluid that when applied to a photograph also alters its subject. After misusing it to make his wife look older and himself look younger, he accidentally spills the fluid over his own photo and erases two-thirds of his face. To create a makeup that was completely smooth and featureless – extending from hairline to chin and obliterating the photographer's left eye, his nose and part of his mouth – Smith taped Morse's nose flat against his face, then made a lifemask. Next he sculpted a foam latex mask that extended out an inch and a half to conceal the diminished, but still present nose protrusion. And since the actor's eye was now deep inside, a glass substitute had to be incorporated. Shot head on, the makeup was startling.

Smith's last assignment for the year was The Picture of Dorian Gray, starring John Fraser as an evil hedonist who barters his soul for eternal youth. Only a portrait of himself that he keeps hidden grows hideous with age. At the end, he attempts to destroy the portrait, and in the process transforms into its depicted state of diseased ugliness. Working from the portrait that had been painted for the show, Smith fashioned a dummy from a plaster skull covered with sculpted plasticine and mortician's wax. Rotting skin was simulated with several layers of vinyl patterned with a sponge, and the eye sockets were filled with red melted wax and artificial orbs. Teeth sculpted in wax and a few strands of wig hair completed the grisly artifact.

1962

With game shows supplanting television drama, Talent Associates soon evaporated and Smith began casting about for motion picture assignments. David Susskind – who, like him, had refocused his attention – was embarking on a film version of Requiem for a Heavyweight, one of the high-water marks of live television's golden age. Smith was promptly enlisted to produce the makeup for Anthony Quinn's broken-down prizefighter, using nine appliance pieces to give the boxer battered

eyebrows and cheekbones, an oft-broken nose and cauliflower ears. Having been brainwashed over the years to believe that film work was much more exacting than television, Smith took great pains to make the most precise and perfect molds, only to find that the appliances he cast from them had unacceptably thick edges. Hopeful that he could solve the problem before production began, he applied the imperfect pieces for a film test and then cringed in the screening room waiting for his deficient work to draw fire. To his amazement and delight, the makeup – which would have never passed muster on television – looked flawless on the big screen. Nonetheless, he persisted in trying to correct its shortcomings, eventually coming to the realization that the molds had been made so precisely that bits of excess foam latex were being compressed within, causing a hydraulic effect that separated the mold halves just enough to thicken the appliance edges. Once identified, the problem was resolved simply by drilling a quarter-inch hole into each positive core. Excess foam would flow into the hole and, after curing, could be easily trimmed from the back of the appliance.

A last-minute dictate afforded Smith his first opportunity to work in Hollywood. The epic comedy It's a Mad, Mad, *Mad, Mad World* was well into production when director Stanley Kramer decided that stuntmen doubling for the lead performers in the climactic fire escape collapse needed prosthetic makeups to withstand the scrutiny of his Cinerama cameras. No one in the Hollywood makeup union was available or willing to take on the short-notice assignment, so Smith was offered the job. With only three weeks to manufacture nearly a dozen masks resembling comic actors ranging from Mickey Rooney to Jonathan Winters, Smith worked himself to exhaustion – almost literally around the clock – then supervised the on-set application. His final feature for the year, All the Way Home – a period drama filmed in Tennessee with Robert Preston and Jean Simmons – involved only straight makeup.

With plasticine and mortician's wax, Smith created a grotesque dummy for the climactic scene in The Picture of Dorian Gray.

1963

The Cardinal – an Otto Preminger picture shot on location in Vienna – presented Smith with his first opportunity to do aging makeup for a feature film. Tom Tryon starred as a dedicated young priest who advances through countless trials and tribulations to become a papal appointee to the College of Cardinals. Smith was called upon to add a slim thirteen years to the actor for his final scenes. The minor transformation was effected with old-age stipple around the eyes, plus subtle appliances to produce naso-labial folds, a slightly longer nose and a small double chin. When the director and cinematographer insisted that the appliances made Tryon's nose look too fat, Smith had to show them that their complaint was with the actor's own nose and not the makeup.

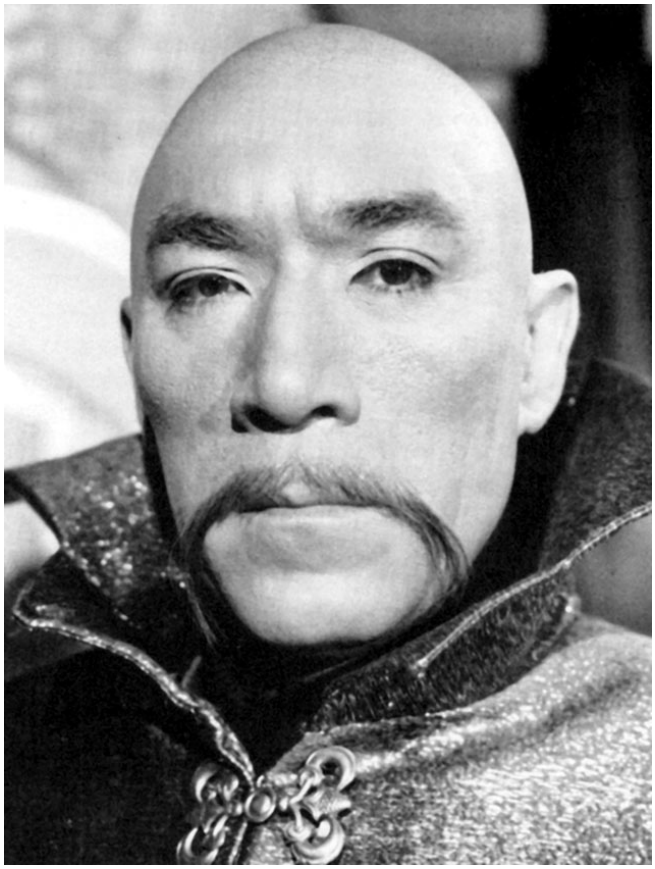
Later in the year, Smith campaigned for the makeup assignment on The World of Henry Orient because of his great admiration for its star. Peter Sellers – a comic genius – was no joy to work with, however. He wanted to look glamorous for his role as an eccentric pianist idolized by a pair of teenage girls, so Smith developed a makeup that reduced his double chin and gave him a small mustache and a flowing hairpiece. Though he professed to like the concept, Sellers berated Smith throughout the shoot, complaining about the time Smith took with the application and impugning his professional competence. When Smith finally suggested that Sellers might be happier with another artist, the actor summarily agreed – but the producer refused to accept Smith's resignation. About five years later, when Smith was approached to do a series of big-budget commercials for Trans World Airlines, he nearly declined when he was told that Peter Sellers would be in them. Explaining to the agency representatives that Sellers would never agree to his involvement, Smith was informed that the actor had specifically asked for him.

1964

Smith was sought by the producers of *Marco the Magnificent* – a multinational production starring Horst Buchholz as the thirteenth-century adventurer Marco Polo – at the behest of Anthony *Quinn*, who wanted him to create his makeup for the role of Kublai Khan. Smith – who had found *Quinn* a difficult subject in Requiem for a Heavyweight – was hesitant to take the assignment, which would require weeks of location filming in Yugoslavia. Rather than turn it down outright and risk being branded as temperamental, Smith decided to squelch the offer by quoting a price that was double his normal fee. The producers accepted, and he found himself committed. Smith employed oriental eye corners and foam rubber nostrils and cheekbones – plus a bald cap – to effect Quinn's transformation into the founder of the Mongol dynasty in China. Smith finished out the year doing straight makeup on the lightweight comedy Harvey Middleman, Fireman – shot in New York and New Jersey – about a married firefighter who becomes infatuated with a young woman he saves from a burning building.

1965

Smith put his career on hold for nearly a year to write a manual for young makeup enthusiasts that sprang from his desire to share his knowledge with others and as an expression of affection for the classic monster makeups of his youth. To illustrate the text, Smith included hundreds of drawings and step-by-step photographs – using his young sons, Douglas and David, as subjects, augmenting them with others recruited from the local high school. The book was issued in magazine form as Famous Monsters' Do-It-Yourself Monster Make-up Handbook by Warren Publishing – publishers of Famous Monsters of Filmland – and twenty years later was revised and updated for a trade paperback retitled Dick Smith's Do-It-Yourself Monster Makeup published by Harmony Books. Many of today's top makeup artists credit the book with getting them started – a consolation for Smith who earned virtually nothing from the endeavor.



Anthony Quinn as Kublai Khan in Marco the Magnificent.

1966

After his writing hiatus, Smith reentered the television arena upon encountering a dearth of feature film opportunities. His return production was Star Wagon, a fantasy calling for an ensemble of predominantly young actors – Dustin Hoffman among them – to be transformed through magical happenstance to late middle-age. Since the project had a small budget and there were about fifteen performers to age, Smith used stock appliances wherever possible, running new pieces out of molds he had retained from earlier, better-funded, productions. *It* was a technique he used often on commercial assignments.

In The Good Lieutenant, a public television drama, Fritz Weaver played a character patterned after literary giant Ezra Pound, whose fervid pro-Nazi stance during the second World War resulted in his subsequent arrest and incarceration in an insane asylum. Smith aged Weaver for the part, using appliances to suggest a rugged, wrinkled

countenance which he then covered with a thick beard. Since the actor was highly allergic to spirit gum, Smith had to cut the foundation for the beard into small sections and adhere them with latex.

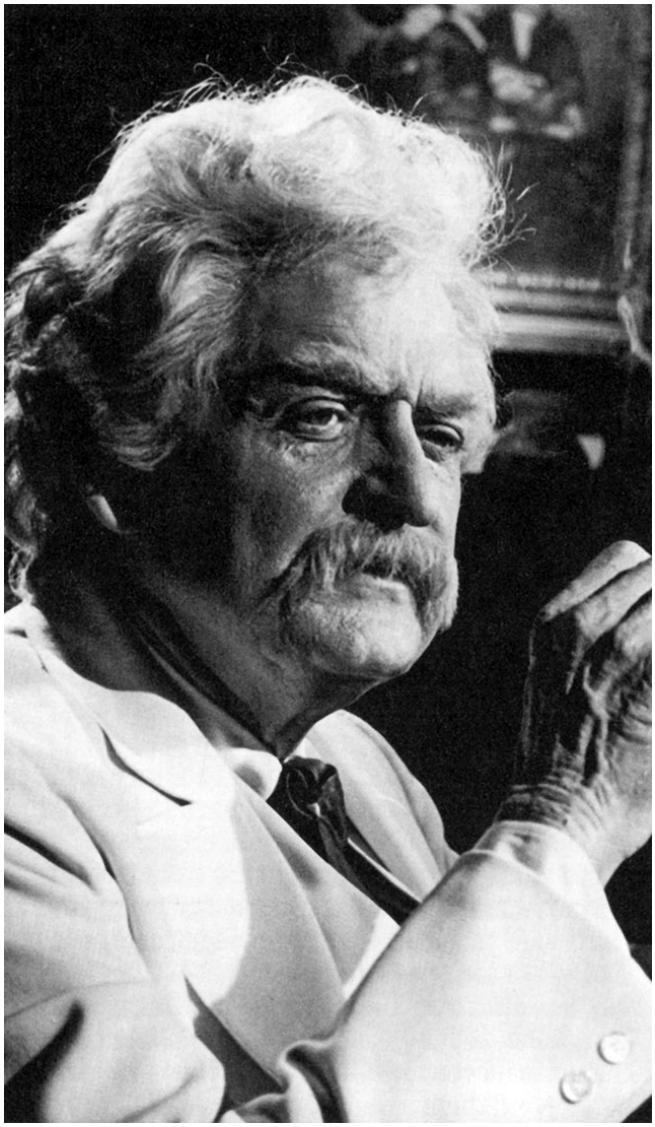
Smith aged Jean Simmons more than thirty years for Soldier in Love.

Smith finished out the year with straight makeup assignments on The Diary of Anne Frank – a David Susskind production with Diana Davilla in the title role, and Max von Sydow and Lilli Palmer as her parents – and The Lesson starring Fred Gwynne.

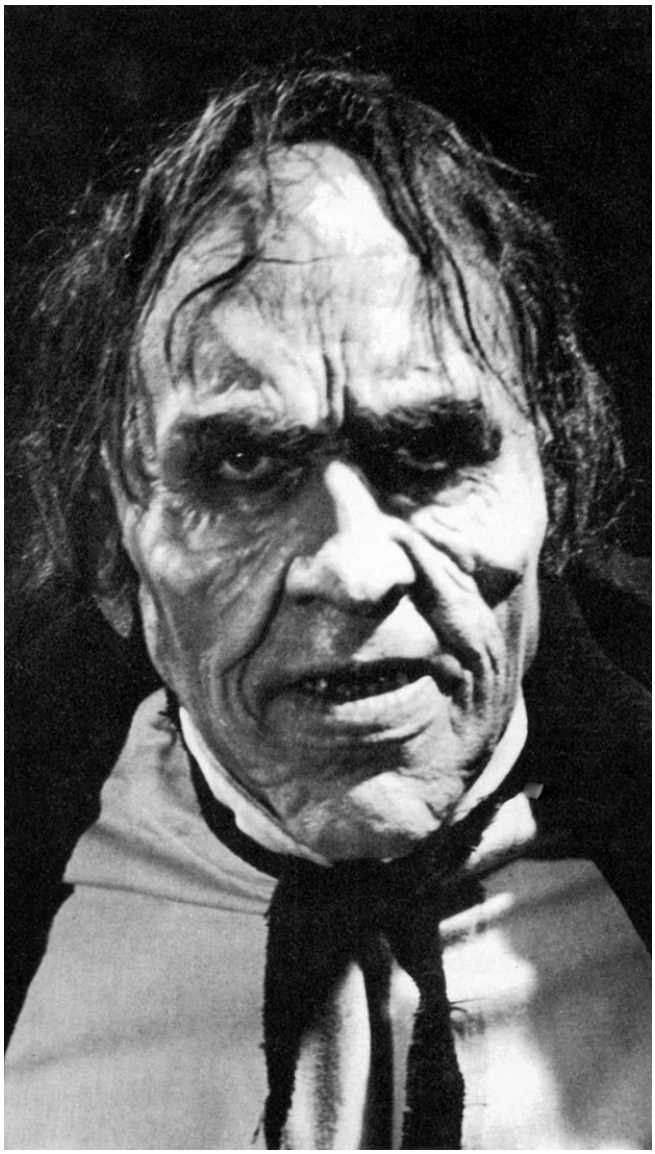
1967

As a freelance artist, Smith returned to NBC for a lavish period piece, Soldier in Love, starring Claire Bloom as Queen Anne and Jean Simmons and Keith Michell as the Duchess and Duke of Marlborough. *It* was a heavy makeup show, with the final scene requiring all three characters to be aged into their sixties and seventies. Smith devised the elaborate appliance makeups and, in a far cry from his days in live television, spent three hours painstakingly applying them to Simmons, while two other artists – Lee Baygan (who had taken over the makeup department at the network) and Scott Cunningham – did Michell and Bloom.

Accustomed to the rushed working conditions typical of both television and feature work, Smith luxuriated in the ample time he was given to test and refine his makeup for Mark Twain, Tonight!, a television presentation of the one-man show Hal Holbrook had perfected on stage over a period of years. Holbrook, an accomplished makeup artist in his own right, was accustomed to using theatrical makeup techniques to create a serviceable resemblance to the noted humorist and author. *It* was realized by all, however, that more extensive makeup would be required to sustain the illusion in televised closeups. Working over a lifecast of the actor, and with constant reference to historical photographs, Smith sculpted a striking likeness of Mark Twain. A four-hour application covered Holbrook's entire face with foam latex pieces, yet still gave him freedom of expression. One element of the makeup was a plastic piece that elevated the actor's natural hairline to resemble that of his older subject. Commenting that the hairline piece looked a bit too smooth, Holbrook suggested adding liver spots to the area. Smith did so; and the technique has since become near-standard on old-age makeups. Costuming for the show prompted the development of a new rub-proof makeup paint. Holbrook was to wear a white suit – a Twain trademark during public appearances – and Smith realized that traditional rubber mask greasepaint would rub off visibly on the neck and cuffs. The problem was solved with a mixture of latex and acrylic paint. Mark Twain, Tonight! earned Smith an Emmy for best makeup.



Smith won an Emmy for his makeup on Hal Holbrook in Mark Twain, Tonight!



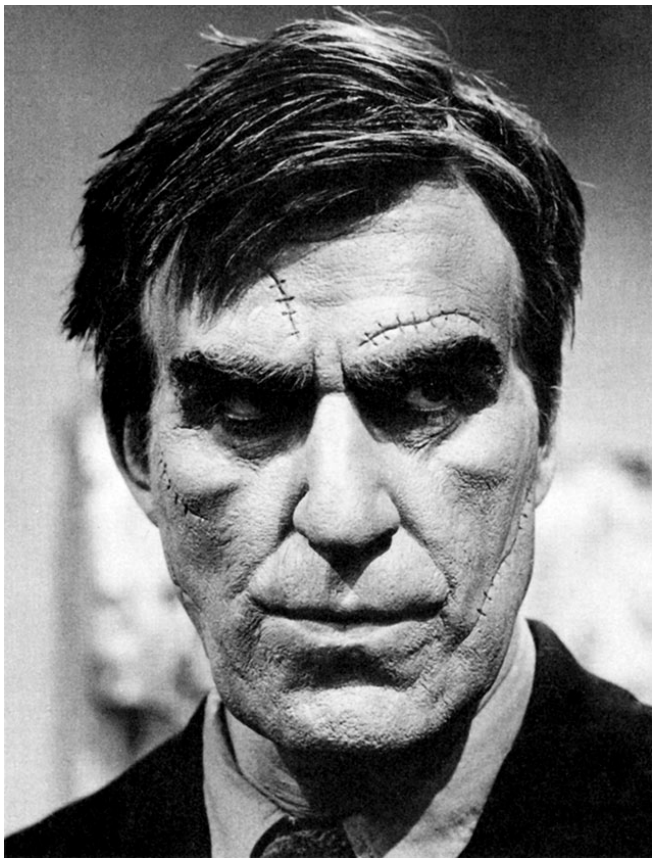
For The Strange Case of Dr. Jekyll and Mr. Hyde, Smith devised a Hyde makeup for Jason Robards. When the part was recast he developed a new concept for Jack Palance.

The Strange Case of Dr. Jekyll and Mr. Hyde was the first of several involvements Smith would have with producer Dan Curtis. Jason *Robards* was cast in the lead, and Smith devised an elaborate makeup to transform his beneficent Jekyll into the miscreant Hyde. After only a few days of shooting in London, however, a strike shut the production down and Curtis ordered the company back to the United States. The project resurfaced a few months later with a new script and a new director – and a new actor since *Robards* was no longer available. The casting of Jack Palance forced Smith to reconceive the Hyde makeup. Since Palance already had an enormous head and face, an extensive additive makeup of the sort he had devised for *Robards* would have looked unbelievable. After much consideration, Smith was struck with the notion of patterning the makeup on classic representations of a mythological satyr. Though still requiring major appliances, the makeup was considerably more subtle than previous concepts and its design origin seemed apropos to the pyschosexual subtext of the script. Palance – whose own nose had been severely broken – also underwent appliance makeup for his scenes as Jekyll, with Smith providing him a foam latex substitute that was straighter and more handsome. Soon after completing the Jekyll and Hyde project – which earned him an Emmy nomination – Smith was engaged again by Dan Curtis to produce an extreme old-age makeup for the supernatural soap opera, Dark Shadows. Actor Jonathan Frid – playing a 175-year-old vampire – was to be rendered his character's true age for a special episode. Though a rush job, it was a valuable training exercise that would serve Smith well in years to come.

Jonathan Frid as an ancient vampire in the television soap opera Dark Shadows.

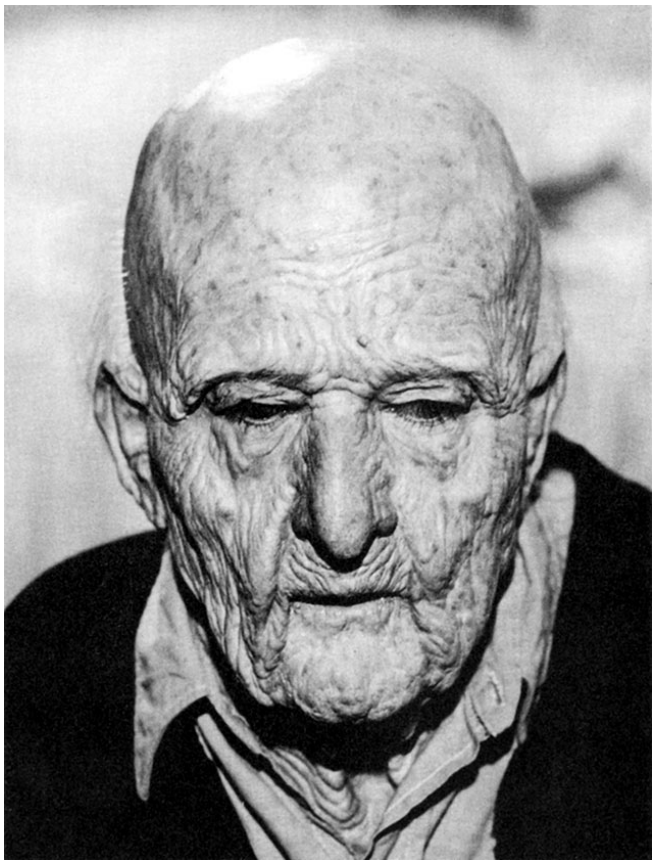
1968

Just days before director John Schlesinger was to start principal photography on Midnight Cowboy – a dark and poignant drama of New York street life – Smith received a panic call from the producers asking him to redesign the makeup they had for the seedy hustler being played by Dustin Hoffman. *Improvising* as he went, Smith began by giving the actor a butchered haircut. Then, to impart a matted, unwashed-for-months look to the hair, he massaged in white mustache wax thinned with alcohol and hot water – a concoction inspired by a waxy paste used by kabuki dancers on their traditional wigs – which, when dry, produced the desired grungy effect. Smith next applied a dirty-brown stain to Hoffman's face, working it into his skin and stubble beard to further convey an unwashed appearance. A prosthetic sty and milky eye drops completed the makeover. Smith refined the look during the first week of shooting and then turned the makeup over to *Irving* Buckman to complete the film.



Fred Gwynne as the ominous Jonathan Brewster in Arsenic and Old Lace.

For a television production of Arsenic and Old Lace – starring Helen Hayes and Lillian Gish as spinster sisters with a penchant for poisoning gentlemen boarders – Smith was enlisted to devise a makeup for Fred Gwynne whose murderous character bristles whenever his uncanny likeness to Boris Karloff is noted. Smith had conceptual problem in that Gwynne – who had already spoofed the *Frankenstein* monster for two seasons on The Munsters – possessed an essentially comic face that seemed inappropriate for the psychotic killer he was depicting in Arsenic and Old Lace. To enhance his likeness to Karloff, Gwynne was given appliances to broaden his face, making it heavier and bonier, and others to extend and widen his forehead. His hairline was receded at the temples, and he was provided a new nose, heavy eyebrows and a long upper lip. Completing the job were large facial scars with crude stitch marks.



Smith invented overlapping appliances for his extreme old-age makeup of Dustin Hoffman in Little Big Man.

Smith faced an opposite challenge on his next feature assignment – Me, Natalie – in which he was called upon to transform Patty Duke into a plain jane who, in the course of the film, makes a subtle transformation into a lovely young woman. To accomplish his objective with minimal cheating, he gave the actress a slightly enlarged nose and fitted her with dentures to make her front teeth more prominent. Other alterations were achieved with straight makeup and hair styling.

1969

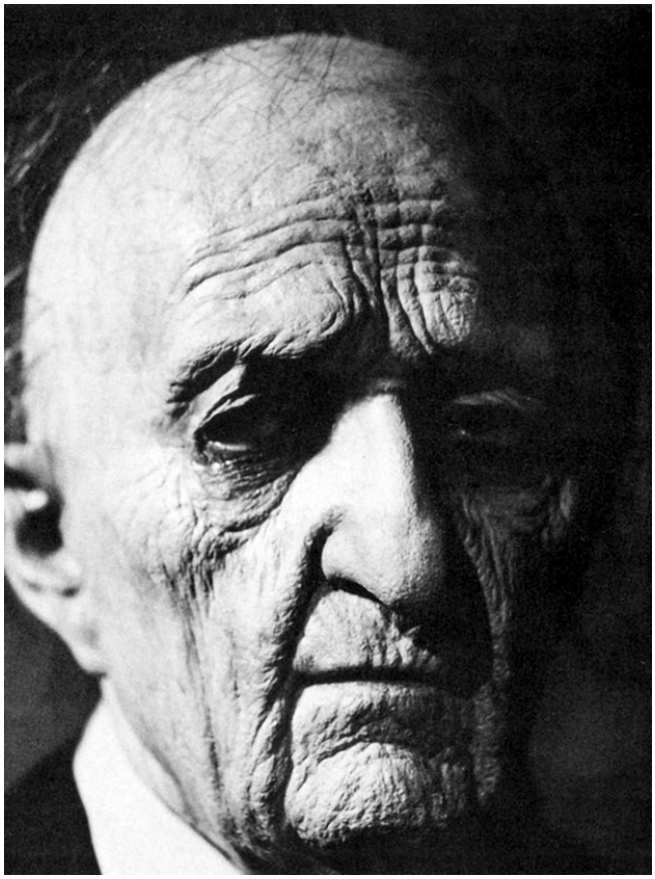
Little Big Man was Smith's first big break on a Hollywood movie and one of his most significant life achievements. Hired by director Arthur Penn – with whom he had worked on numerous television productions during the NBC years – Smith was tasked with designing and applying makeup for Dustin Hoffman as a 121-year-old dotard whose reminiscences, revealed in flashback to a journalist, tie him to many of the pivotal events and personages of the Old West. *In* the course of the narrative, Smith had to transform Hoffman – then thirty-one years old – into a teenager, a gunslinger, a cavalry scout and a town drunk. Most challenging, however, were the scenes of him as the aged storyteller. Although single-piece appliances were the norm – even for full-face makeups – difficulty in applying them, coupled with the tendency of foam latex to shrink, led Smith to devise a new approach involving multiple overlapping pieces. Crucial to its aesthetic success was his concurrent development of a technique whereby the makeup could be sculpted intact on a single lifecast, then sliced into separate pieces and placed individually on secondary lifecasts where the edges could be feathered and overlapped. After much experimentation, Smith discovered that a thin coat of dental separator, applied to the lifecast prior to covering it with clay, would allow the finished sculpture to be removed from its plaster form simply by soaking it for a while in water. *In* addition to eight separate appliance pieces, Hoffman was fitted with another Smith innovation in the form of blinking eyelid appliances. Extremely thin foam latex pieces, the eyelids were attached at the top – just under the eyebrow – and at the bottom slightly above the eyelash. The area in between was not glued down. Thus, whenever Hoffman blinked, the eyelid would fold and unfold realistically. *Contact* lenses were employed to give the eyes themselves an aged appearance. The five-hour makeup was rendered complete with shoulder pads and old-age hand appliances which accentuated the actor's knuckles to make his fingers look thin and frail. Smith's overlapping appliances – though derided by many of his contemporaries at the time – have since become the industry standard.

1970

Dan Curtis directed and produced *House of Dark Shadows* – a feature film extension of his television soap opera, then winding down after a five-year run. For a scene in which the celebrated vampire – again played by Jonathan Frid – reverts physically to his true age after the failure of an experimental procedure to cure him, Smith was called upon to recreate the aging makeup he had provided for the television show. Freed of some of the constraints he had faced on the earlier assignment, Smith took the makeup somewhat further, rendering the vampire essentially bald, rather than just graying. Cognizant of the film's limited budget, Smith was pleased to be able to reuse the folding eyelids and part of the bald head he had created for Dustin Hoffman on *Little Big Man*, as well as some of the appliances he had fashioned for Frid three years before. Another of his tasks was

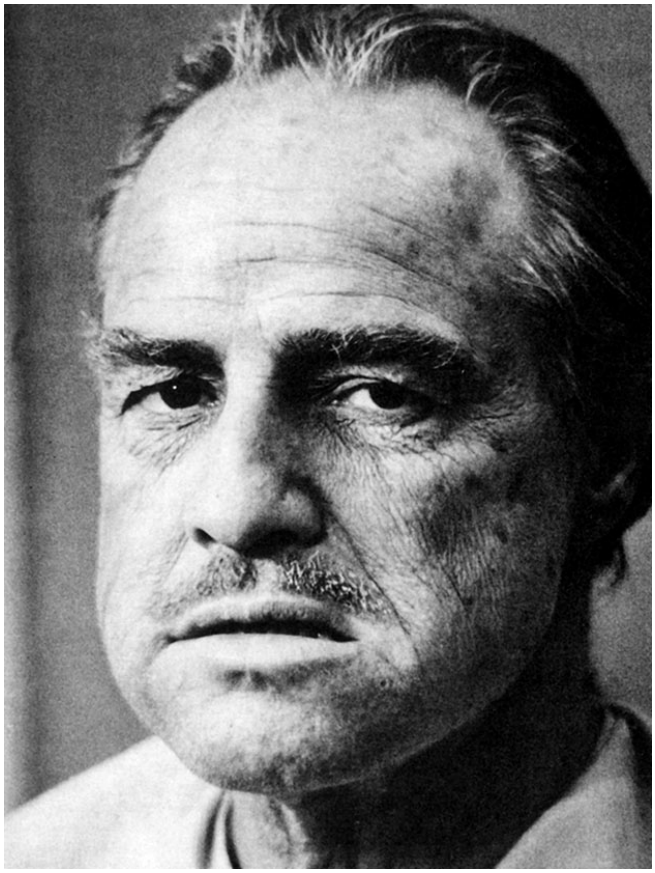
developing realistic bite marks – an obsession with Curtis who scoffed at the tiny pin-pricks usually seen on vampire victims' necks. After several unsuccessful attempts at sculpting a convincing wound, Smith opted for the more direct approach of biting into a piece of raw veal, enlarging the canine incisions a bit and making a casting of the meat.

A more subtle aging makeup was required for his next film project Who *Is* Harry Kellerman and Why *Is* He Saying Those Terrible Things About Me? *In* the surrealist comedy directed by Ulu Grosbard, Dustin Hoffman played a successful middle-age composer tormented by loneliness and depression. Since the aging was not extreme, Smith was able to achieve the desired effect with a little old-age stipple around the eyes to complement subtle eye bag and naso-labial fold appliances. A graying mustache, sideburns and a curly wig completed the illusion.



For House of Dark Shadows, Smith revised his earlier concept for aging Jonathan Frid.

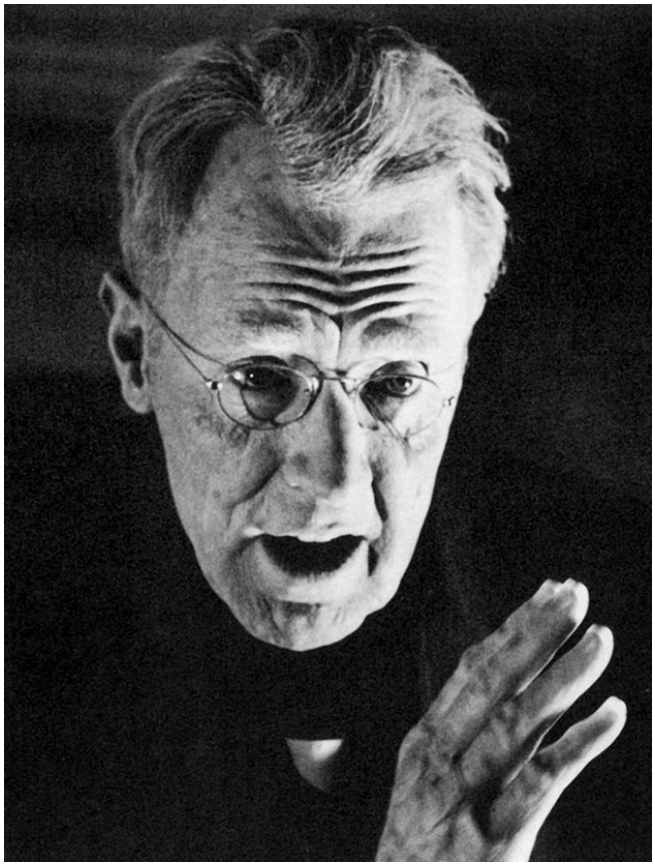
1971



Hair coloring and stipple – plus a dental plumper – aged Marlon Brando in The Godfather.

Smith was hired onto writer-director Francis Ford Coppola's sprawling gangster epic, The *Godfather*, principally because of his acknowledged expertise in old-age makeups. Marlon Brando, then forty-seven, had to be aged twenty some years for his title role as the ruthless, but principled, Mafia don. When Brando proved unreceptive to facial appliances, Smith instead used old-age stipple to create suitable wrinkles. The actor's naturally light hair was dyed black, then highlighted with gray. Subtle jowls were simulated with a dental plumper that fit snugly between his lower teeth and cheeks. For a brutal gangland execution, Smith created the impression of facial bullet hits on actor James Caan by affixing blood-filled blister appliances that would rupture when monofilament trigger lines – invisible to the camera – were pulled. When a problem scuttled the first take – after the blisters had already broken – the labor-intensive illusion had to be abandoned for lack of setup time. Smith simplified the effect for a later execution. A small explosive squib was placed over a protective metal plate attached to Sterling Hayden's forehead, which was then covered completely with foam latex skin. Smith next used a hypodermic needle to inject fake blood into a shallow cavity under the appliance. When the squib was fired, the rubber skin ruptured and the blood poured out. The *Godfather* marked the first large-scale employment of a simple, yet effective movie blood Smith had formulated from Karo syrup and food coloring.

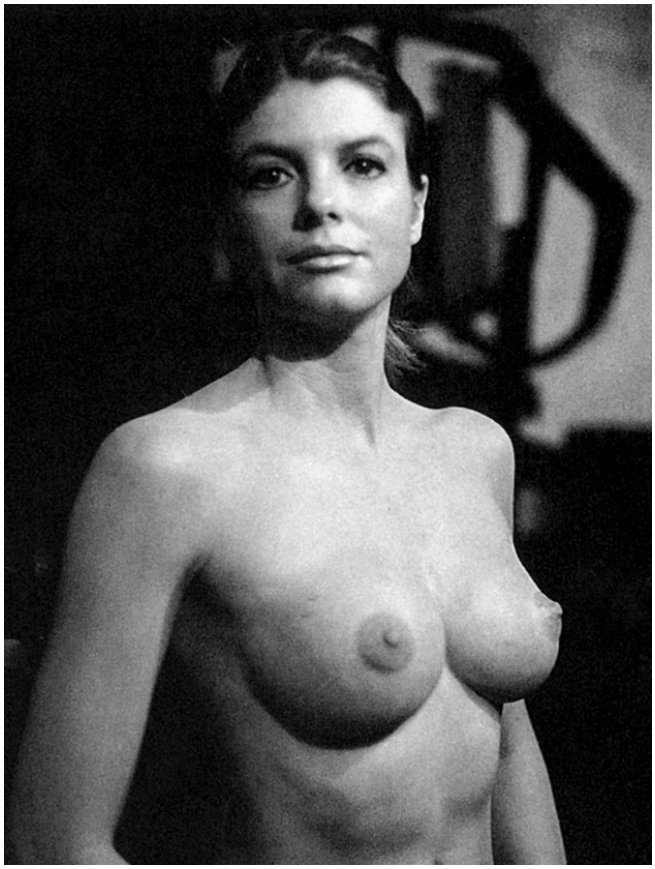
Harriet – one of Smith's biggest TV projects – starred Kitty Winn and Richard Dysart in the life story of abolitionist and author Harriet Beecher Stowe. Four stages of appliance makeup were need to advance Winn from her late twenties to middle eighties. Depending on the extent of the makeup, overlapping or multiple isolated appliances were employed. For Smith, the principal shortcoming of the makeup was that there was no budget for old-age contact lenses, and Winn's dark brown eyes seemed somewhat incongruous staring out of an ancient face. Dysart also required aging makeup – in five stages – and Smith had other actors to age as well.



Smith used appliance pieces and stipple to age Max von Sydow for his title role in The Exorcist.

1972

Smith began the year with Particular Men – a quasi-historical television drama – in which he made up Stacy Keach for a role that was patterned after physicist J. *Robert* Oppenheimer who headed the Manhattan Project to produce the world's first atomic bomb. No attempt was made to make Keach look like Oppenheimer, but subtle appliances were employed to conceal the actor's surgically-repaired harelip and to render his face more angular and a bit older looking. For scenes of his character as a young man, Keach needed only a moderate hairpiece to fill in his receding hairline.



For a scene in The Stepford Wives, Smith fitted Katherine Ross with enlarged foam latex breasts.

Though it was the assignment of a lifetime, the pivotal makeup for *The Exorcist* proved torturous for Smith, who submitted a dozen concepts to director William Friedkin before one was agreed upon. Especially challenging for him was the task of sublimating the fresh-faced innocence of twelve-year-old Linda Blair and transforming her into a frightened – and frightening – victim of demonic possession. The early-stage makeup consisted of multiple appliances designed to simulate facial scratches. During the course of the film, the lacerations were made progressively worse and were supplemented with other appliances that distorted her features. Bruises and demonic contact lenses were incorporated in later scenes. Smith employed primitive bladder technology – a condom glued to the underside of a foam-latex appliance – for a scene in which the youngster's throat needed to distend almost like a frog's. He also worked with adult actress Eileen Dietz who was hired to double for Blair in some of the film's more difficult scenes – including a shocker in which she had to spew green vomit onto a priest. Smith ran flat tubing up the sides of the woman's face and into the corners of her mouth so that the openings faced outward. Appliance pieces and a partial mask concealed the tubing, which ran beneath her ears and through her hair to a pressure pump filled with pea soup. For a scene of the child's head turning completely around, Smith and assistant Rick Baker fashioned a dummy made from full-body castings taken of Blair. Head and facial movements were achieved with radio-control mechanisms devised by Marcel Vercoutere. Arms and legs were positionable, but nonarticulated. Smith also designed the makeup worn by Max von Sydow for his title role in the film.

To add thirty years to the actor, Smith employed appliance pieces and old-age stipple, combining and blending the two with great finesse. Aware that filming was to take place in a blistering desert and on sub-freezing soundstages, Smith worried that traditional stipple would flake or peel away. After confirmation and extensive testing, he concocted three formulas of his own which continued

to serve him admirably for years. Since Smith was busy with Linda Blair, fellow artists Robert Laden and Reg Tackley applied the von Sydow makeup for most of the shoot.

1973

Further avenues for creative mayhem were explored in The *Godfather* Part II. For a scene in which a petty Mafia don has his throat slashed by street punks, Smith fitted actor Gaston Moschin with a precut neck appliance held together lightly with a sticky syrup. When the actor's neck jerked back, the severed appliance would split open. Compressed air sent blood gushing through tubes into the piece, with Moschin himself triggering the flow via a hand control. The complex scene, ultimately relegated to the cutting room floor, was reinstated when Francis Ford Coppola reedited and expanded the first two films into The *Godfather* Saga for home video. Though the don survives the assault, he is not so fortunate later when Robert De Niro sticks a gun in his mouth and blows the back of his head off. Smith oversaw the execution, as well as other bloodletting for the sequel. He also employed minimal makeup to heighten De Niro's likeness to Marlon Brando, whose character in the first film he was portraying at a younger age.

1974

Smith had a most unusual assignment on *The Step ford Wives* – a Bryan Forbes film in which a young woman, played by Katherine Ross, moves with her family to a small New England town whose male residents are systematically replacing their wives with replica robots that are more perfect in every respect. For a climactic scene in which she discovers her own mechanical clone, not yet fully completed, both characters were to be played by Ross. As the robot, the actress would be wearing a see-through nightgown revealing breasts that were clearly more ample than her own. *It* was up to Smith to effect the enhancement. Years earlier, he had been given a similar assignment by director Mike Nichols who was then considering Karen Black for the role eventually played by Ann-Margret in Carnal Knowledge. Nudity was required, and Black was not considered adequately endowed for the role; so Smith made a casting of her breasts, sculpted new ones for her and produced them in foam latex. For whatever reason, Black did not get the role and the breasts were never used. Smith was prepared to repeat the process with Ross, but decided first to see if the Karen Black breasts would be serviceable – and with minor alterations, they were. To increase the eeriness of the scene, it was decided that the robot's eye sockets should be empty. With careful lighting to avoid reflections, Smith felt that black scleral contact lenses would produce the desired effect. With the way the scene was shot, however, reflections proved unavoidable; so instead of empty eye sockets, the incomplete robot appears to have shiny black orbs.

1975

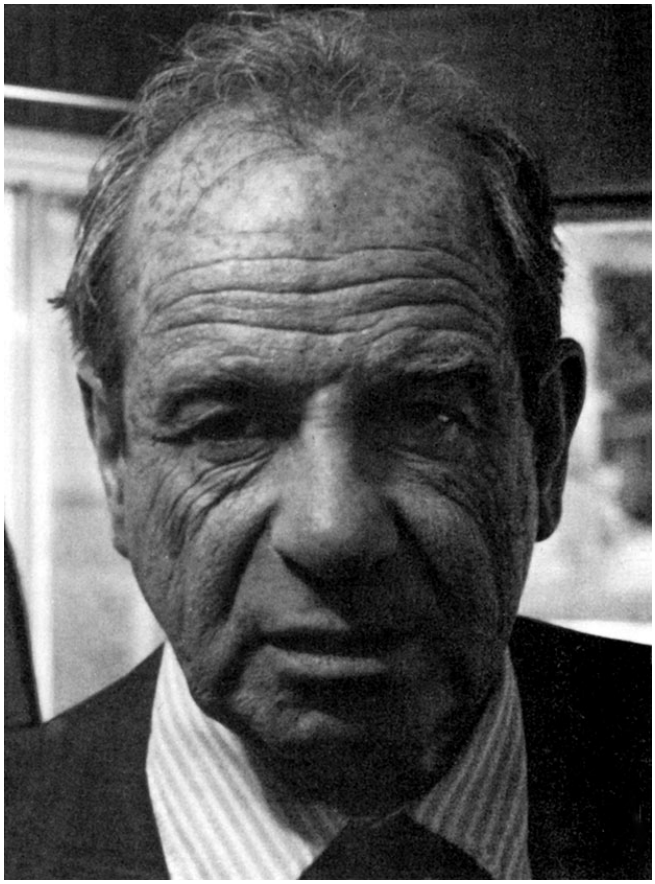
For The Sunshine Boys – a Herbert Ross film of the Neil Simon play about two estranged vaudeville partners reunited for a television special – actor Walter Matthau had to be aged twenty years for his role as an irascible septuagenarian. The most difficult aspect of the process for Smith was that Matthau had a low hairline – rendering the use of a wig problematic – and a full head of black hair that would have been difficult to gray. To create a balding head, Smith – using a technique that he invented – spent three hours with scissors and a magnifying glass snipping individual hairs from the actor's scalp until a natural balding pattern was simulated. The remaining hair was then dyed

gray. Daily touchups with a fine-screened electric shaver kept the stubble trimmed while leaving the longer hairs unshorn. Matthau's face was aged rather simply with stipple and liver spots.

On Taxi Driver – director Martin Scorsese's study of inarticulate rage and violence – Smith contributed heavily to the bloody final act. For scenes in which Robert De Niro's sociopathic cab driver shaves his head and goes out into the mean streets with mayhem on his mind, Smith made a bald cap for the actor with a Mohawk-style roach running up the center. To suggest a residue of hair stubble on the shaved areas, Smith had to concoct a slow-drying adhesive that would stick to the plastic cap, hold the chopped hair and yet not be shiny. Armed to the teeth, De Niro storms a den of iniquity, ostensibly to rescue a young prostitute, and a murderous bloodbath ensues when her pimp and his cronies resist. Though he found the script's violence abhorrent, Smith detached himself from it sufficiently to produce an array of gory effects. For a scene in which one of the thugs has half of his hand blown away by a gunshot, Smith fabricated the hand – minus four fingers and part of the palm – out of rubber and rigged it with blood tubes. The sections to be severed were then cast in wax and fitted into place on the hand. Worn as an arm extension by the actor, the fake hand was rigged with explosive squibs that were detonated on cue to blast away the fingers and start the blood flow. For another man, shot in the face four times, Smith refined his *Godfather* technique, attaching facial appliances with small recesses that could be filled with blood from a hypodermic needle and then popped open using a monofilament line invisible to the camera. Elsewhere in the sequence, Smith had to provide a blood-spurting appliance for a scene in which De Niro is shot in the neck.

Smith renewed his association with director John Schlesinger on *Marathon Man*, a taut thriller in which Dustin Hoffman, playing a college student and Olympic hopeful, runs afoul of a former Nazi war criminal and dentist who tortures him by drilling into his front teeth. So the scene could be effectively conveyed, Smith took castings of the actor's teeth and then had a dentist make removable veneers that fit over the front six. Hoffman wore them throughout the production so there would be no evident difference before and after the drilling scene. For Roy Scheider, Smith prepared a gelatin appliance laced with blood passageways, which was fitted onto the back of the actor's hand and sliced open during a scene in which a thug attempts to garrote him.

Other projects for the year included making up Lorne Greene as *George* Washington for an *Imax* film sponsored by Eastman Kodak and exhibited in Washington D.C. during the nation's bicentennial celebration. Smith also stepped in, during postproduction, to help with Burnt Offerings. Dissatisfied with the ending of his haunted house film, Dan Curtis asked Smith to create a really evil-looking old-age makeup for actress Karen Black. Smith traveled to Los Angeles and devised three different concepts, one of which was selected and shot as an insert.



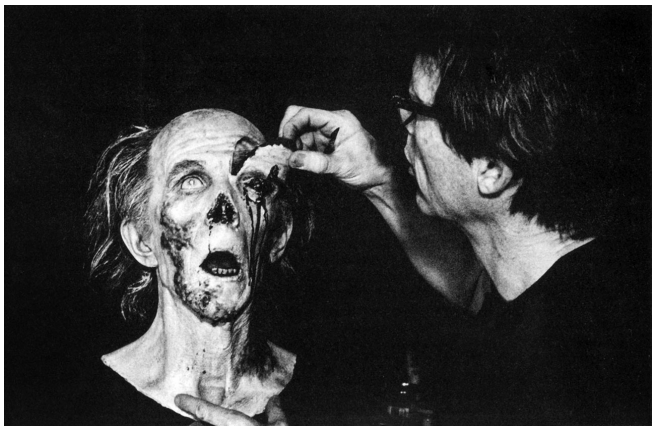
Smith devised a hair-thinning technique to age Walter Matthau for The Sunshine Boys.

1976

For a TV production of Harry Truman, Plain Speaking – another one-man show in the vein of Mark Twain, Tonight! – Smith was called upon to transform actor Ed Flanders into a passable double for the colorful and outspoken chief executive. He began by stripping the actor's natural hair color to render it white. Even though Flanders was considerably younger than the man he was portraying, his hairline had already receded further than the former president's, so a small hairpiece was used to compensate. Also employed were appliances for the tip of his nose and for his neck and the sides of his face. The makeover also required a pair of thick eyeglasses – which were problematic since Flanders could barely see while wearing them. Smith resolved the difficulty by fitting the actor with contact lenses that effectively counteracted the glasses' extreme magnification.

Director Michael Winner pushed a reluctant Smith to new heights of gratuitous bloodletting on The *Sentinel*, a horror film centered upon the premise of an apartment building in New York being the gateway to hell. *In* the end, the gateway is breached and the building overrun by hoards of ghoulish monstrosities returned from the dead. One especially gory encounter had the lead character fending off her father's reanimated corpse by plunging a butcher knife into its arm and chest, then stabbing its eye and slashing off its nose. For the chest stab, Smith cast torsos out of styrofoam and fitted them with pressurized blood chambers. For the facial mutilations, he made a lifecast of the actor and then fabricated a head with replaceable eyes and noses made from gelatin. Smith also produced makeup effects for a number of players who had been recruited, specifically and tactlessly, because of physical deformities or missing limbs. Smith's commitment to The *Sentinel* limited his participation in the concurrent – and later much maligned – *Exorcist II*: The Heretic directed by John Boorman. He did, however, manage a reprise of his demonic makeup – this time on a double for Linda Blair, whose contract disallowed special makeups – as well as appliance work for a young African undergoing exorcism, and aging makeup for a cameo appearance by Max von Sydow.

Appliance makeup on Ed Flanders for his title role in Harry Truman, Plain Speaking.



Between takes, Smith repairs a puppet head he created for a gruesome mutilation scene in The Sentinel.

1977

Though hesitant to take a third consecutive horror film, Smith agreed to design the makeup effects for *The Fury* provided that the fabrication work be turned over to Rick Baker and the application to Bill Tuttle who was doing makeup on the show. The Brian De Palma film – about a pair of telekinetic teenagers victimized by an opportunist who endeavors to develop their psychic powers for his own dark purposes – involved numerous instances of spontaneous bleeding caused by psychic projection. Smith devised means to create convincing nosebleeds and bleeding fingernails – also massive hemorrhaging from the mouth and nose for a scene in the film's bloody finale. He also designed and built forehead appliances for actor Andrew Stevens using a translucent plastic material through which he ran inflatable air channels to suggest pulsing veins. These, too, were turned over to Tuttle for application. Delays in the production would eventually create a scheduling

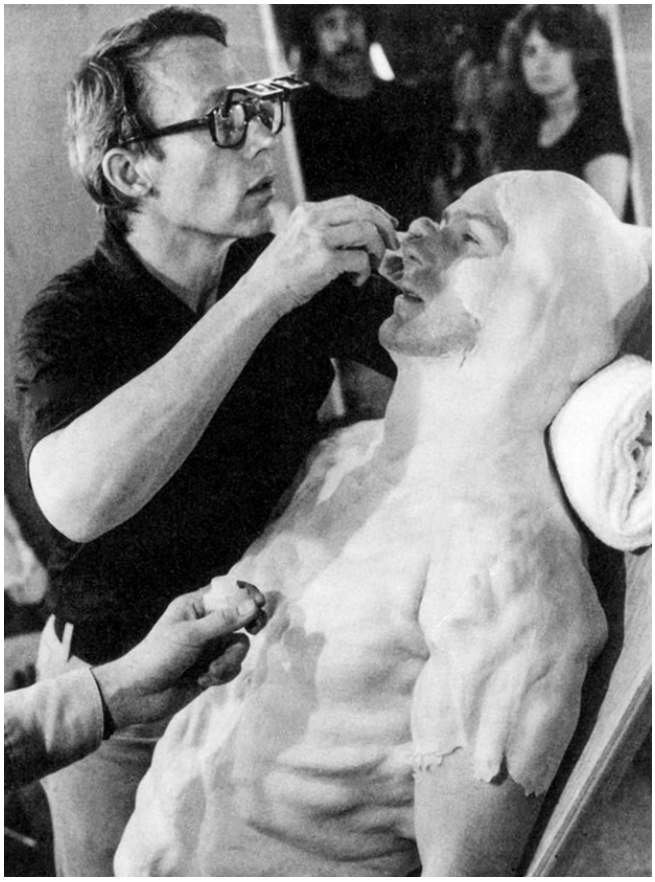
conflict for Smith who was forced to move on before shooting was finished, leaving the effects-heavy deaths of villains John Cassavetes and Fiona Lewis solely in the hands of Baker and physical effects veteran A.D. Flowers. Feeling his abbreviated involvement did not warrant recognition, Smith declined to take a credit on the film.

His involvement in *The Deer Hunter* would also be abbreviated. For the Michael Cimino film – a searing wartime saga of friends transported from the steel mills of Pennsylvania to the jungles of Vietnam – Smith was hired to design the principal makeups and related effects. Having worked twice before with *Robert* De Niro, Smith was aware of the actor's insistent perfectionism and had come to terms with it. However, during shooting of the pivotal Russian roulette sequence in Thailand, a falling out of major proportions occurred over an aesthetic issue Smith felt De Niro had no right to pursue. Harsh words were exchanged and the makeup artist resigned from the film.

1978-1979

Smith spent the better part of two years on *Altered States*, a high-profile project scripted by Paddy Chayefsky from his novel about a young psychophysiologist whose experiments in extreme sensory deprivation coupled with hallucinatory psychedelic drugs alter his state of consciousness and, ultimately, his mental and physical being. For the earliest stage of the physical transformation, Smith and associate Carl Fullerton pioneered the use of inflatable microthin bladders, incorporated into facial and forearm appliances, to produce pulsating protuberances on William Hurt. A later altered state required three contorted body suits, with accompanying prosthetic appliances, in progressive stages of mutation. Since the positions Hurt would have to hold during body-casting for the suits were awkward and painful, Smith devised a technique by which the process – normally requiring a minimum of fifteen minutes – could be completed in less than five. Also constructed was a suit for costar Blair Brown which was sculpted to look as though her flesh were seared and cracking, revealing an eerie glow within that was produced by painting scotchlite material into the cracks and projecting lava imagery onto it. Other fabrications included a vastly larger-than-life head of Hurt in mid-scream and ape-like foot appendages for a psychedelic flashback. A full ape-man makeup – applied to a slight dancer for a sequence in which the hallucinating scientist regresses to a primal state – entailed full facial appliances, with yak hair pasted directly onto the performer's body by makeup associate Craig Reardon. Smith went into the film anticipating it would be the kind of career high-point *The Exorcist* had been. Such was not the case. The original director, Arthur Penn, was fired off the picture late in preproduction and replaced by Ken Russell. Most of the original creative team also departed, voluntarily or otherwise, leaving a continuity vacuum that impacted adversely on the production. Much of the work Smith had done required significant changes during the chaotic shoot; and, in the end, little of it was seen. One of his transformation suits was deleted entirely, and the other two were largely obscured by opticals.

1980



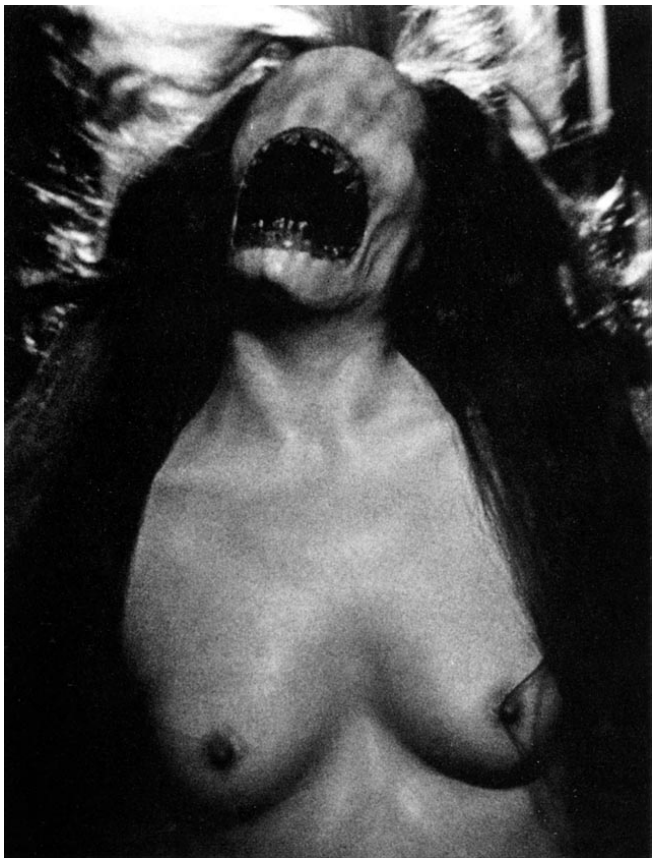
Smith applies one of three mutation suits – with accompanying facial appliances – designed and built for William Hurt in Altered States.

Early in the Sylvester Stallone action thriller Nighthawks, an international terrorist played by Rutger Hauer undergoes extensive plastic surgery to alter his appearance. Smith reversed the process by altering Hauer for his opening scenes so that in the rest of the film he would require no special makeup. Appliances were employed to make the actor's lean face more round and to twist his nose slightly. Dentures changed his teeth and puffed out his upper lip a bit. Hauer's naturally blond hair was dyed brown and restyled, and his blue eyes were darkened with contact lenses. Smith also had the singular task of making undercover cop Stallone into a woman decoy. Since the actor had grown a beard for the film, Smith had little recourse but to use a mask rather than appliances. For a sequence in which a female terrorist is shot in the head by a police sharpshooter, director Bruce Malmuth specified that he wanted to see both entrance and exit wounds in the same shot. Smith labored over the tricky assignment, experimenting endlessly with explosive squibs and blood sacks to produce the illusion without risk of injury to actress Persis Khambatta. The effect would be one of his few career failures. After placing a blood-filled baggy and a small squib on a protective metal plate, Smith affixed the plate to Khambatta's scalp using blood paste – a thickened version of his corn syrup blood. He had not, however, taken into account all weather contingencies. A light rain during the shoot rendered the paste too slippery to adhere, and the shot had to be reconceived and cheated on the spot.

Other assignments included special makeup for Christopher Walken in his role as an American mercenary enlisted to overthrow a small African government in *The Dogs of War*. Smith also supplied the appliances needed to age Richard Lynch thirty years for his appearance in The Formula as a former Nazi officer in possession of an invaluable formula for synthetic fuel. And in The Fan – about a famous actress stalked by an obsessive admirer – Smith provided the requisite mayhem including a conceptually complex blood-spurting dummy for a scene in which one of the characters is stabbed in the throat.

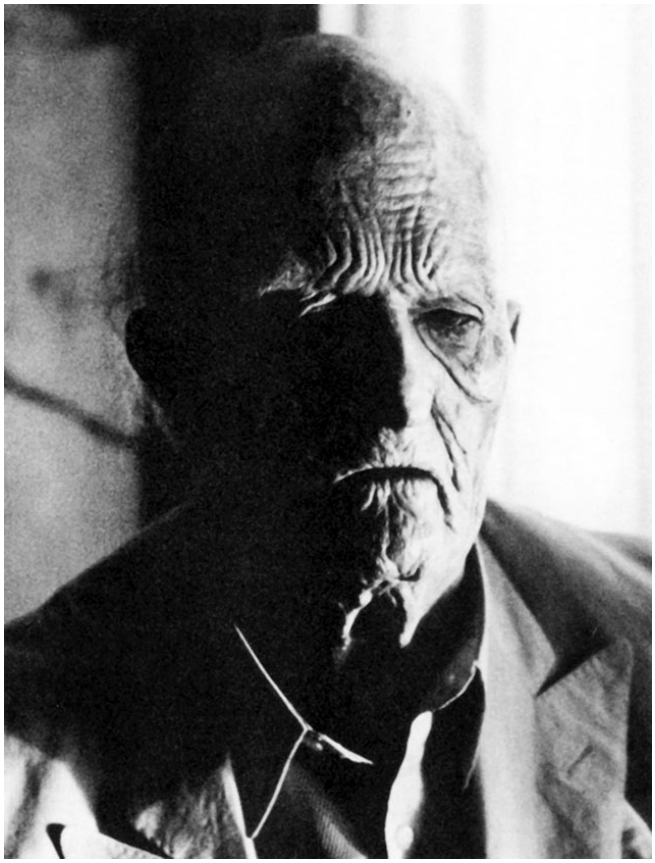
Smith had been approached a year earlier to provide makeup and effects for *Scanners* – a David Cronenberg picture about chemically engineered telepaths who can not only transmit and receive thoughts, but also use their psychic enhancements to cause grievous physiological harm. Having just completed *Altered States*, Smith felt burned out and incapable of tackling another major effects film; so he declined, and the work eventually went to Chris Walas and Stefan Dupuis. During

postproduction, Cronenberg decided to incorporate a new ending in which the two principal protagonists – Michael *Ironside* and Stephen Lack – engage in a deadly telepathic duel. Smith was contacted again and agreed to participate. Modifying the pulsating vein concept he had developed for *The Fury*, he constructed facial and arm appliances for the two actors through which blood, rather than air, would be pumped. Visible through the translucent appliances, the blood could, when required, be made to rupture the vessels and bleed externally. Smith also fashioned a replica of Lack's head for a scene in which his character projects an organic energy stream at his adversary. Further puppet work was required for scenes of Lack gouging flesh from his own face and then self-immolating. Final shots of his remains were realized by fashioning bread dough around a plastic skeleton and then baking it until it was charred. Makeup was applied to suggest raw flesh beneath the surface.



For a spectral apparition in Ghost Story – eventually cut from the film – Smith created a nude puppet that had no facial features except for a gaping maw.

1981



The last of five progressive aging makeups for David Bowie in The Hunger.

Sizable segments of Smith's work were deleted from *Ghost Story*, a John Irvin movie about four lifelong friends who are haunted by the ghost of a young woman whose drowning death they caused fifty years earlier and then covered up. One by one, the old men begin to pay for their guilty secret as frightening apparitions of the woman appear and trigger their premature deaths. Since most of the apparitions were to be seen in tight closeup, Smith reasoned that he would have far more flexibility in creating the desired effects if he produced puppet characters rather than use appliance makeups on actors. He therefore constructed a number of head-and-shoulder puppets – most looking somewhat like drowned corpses – that became increasingly more ghastly as the film progressed. Smith effected minimal facial movement manually by inserting his hand from below to articulate the head and jaws. His most visceral apparition – a nude torso topped with a head that had no facial features save for a gaping mouth filled with rotting teeth – was cut during postproduction and replaced with a more conventional decaying corpse created on short notice. Never filmed for lack of time was a replica of actor Douglas Fairbanks Jr., constructed for his character's fall from a bridge. For a climactic scene in which the woman's body is at last exhumed from the sunken auto where it has been entombed for half a century, Smith and associate Carl Fullerton built a final puppet whose flesh had to slide off its skull on cue. To achieve the effect, gelatin appliances held loosely in place on a plastic skull were released by monofilament wires.

Although he preferred to avoid animatronics, Smith utilized the burgeoning technology to good effect in Spasms – a low-budget Canadian film known also as *Death Bite*. For the death scene of a man bitten by a demonic serpent, Smith – again working with Carl Fullerton – took a lifemask of actor Al Waxman and then prepared a makeup consisting of ultrathin facial appliances designed to conceal eight, independently-operated bladders. When filled with air, the bladders would expand to simulate the victim's face swelling grotesquely into a lumpy mass. A matching puppet was then constructed, with cable mechanisms to create mouth and tongue articulation and bulging eyes. To complete the effect of facial flesh swelling until it splits open, Smith employed trichloroethane – a chemical solvent that causes foam rubber to expand and distort – which, on cue, was pumped through tiny tubes built into the puppet.

1982

For *The Hunger* – director Tony Scott's feature debut about an immortal vampire and her consort who must kill to maintain youthfulness – Smith was engaged to produce progressive makeups for a scene in which David Bowie was to age rapidly to 150 years old. Smith achieved the illusion with five discreet makeups. The first two employed subtle appliances and alterations to the hair and hairline, while the remaining three required full prosthetic coverage of the face. The final two stages further incorporated blinking eyelids and appliances for the hands. For the last stage, in which the vampire is completely hairless, Smith devised a means of casting a foam latex bald head using a core that he could disassemble and remove from the mold to produce a seamless one-piece appliance. Another innovation came about as a result of his having to surmount the problem of affixing a stubble beard to the foam latex appliances – an impossibility over the rubber mask greasepaint customarily used to color such appliances. Smith developed a new coloring medium – derived from an acrylic medical adhesive mixed with paint – that remained tacky until powdered. The sticky surface proved ideal for applying the stubble. The new paint – which Smith named PAX – proved advantageous over rubber mask greasepaint in many regards and is now used widely in the makeup community. *In* the climax of the film, the female vampire's former consorts – tucked away in her attic after succumbing to the inevitability of extreme old age – return to life to take vengeance upon her. Smith created foam latex mummy suits for seven slender performers and, for shots of their disintegration, duplicated portions of the mummies in a crumbling material.

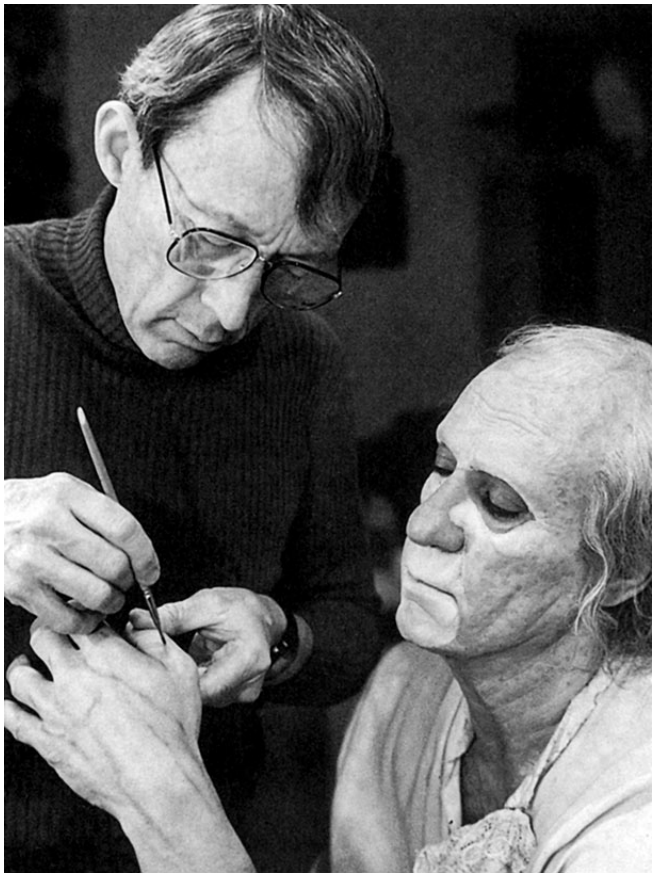
1983

Brought to the screen by director Milos Forman, Amadeus was a lavish depiction of the fictional interplay between real-life composers Antonio Salieri and *Wolfgang* Amadeus Mozart. Smith was called upon to age F. Murray Abraham into the elderly Salieri whose flashback confession to complicity in the decline and fall of his musical rival provides the film with its narrative structure. Everything but the actor's nose was covered by appliances. To obtain a realistic wrinkle pattern for the forehead appliance, Smith made a wax casting of his own forehead and then accentuated the existing wrinkles while adding further detail and texture. Other appliances were sculpted from scratch. Disappointed with the results he had been getting of late from traditional gypsum molds – attributable, he determined, to a deterioration in quality of the gypsum itself – Smith elected on Amadeus to use epoxy resin molds for the larger pieces and gypsum laced with a concrete adhesive for the smaller ones. After successful film testing, Smith manufactured and prepainted all of the appliance pieces he would need in New York, then traveled to Austria where he applied the four-hour makeup about twenty times during the shoot. A balding hairpiece and old-age contact lenses completed the facial makeover. Hands were aged with one of his stipple formulations. Representing the culmination of everything Smith had learned in nearly forty years of aging actors on film, Amadeus earned him an Academy Award for best makeup. He was likewise honored by the British Academy of Film and Television Arts.

Smith finished out the year with a small job on The Cotton Club, Francis Ford Coppola's fact-and-fiction gangster film set against the period glitz of the famed Harlem nightspot. James Remar, cast in the role of Dutch Schultz, was a bit young for the part, so Smith was engaged to age him a few years without elaborate makeup. He did so by designing a novel dental plumper that not only extended below the gum line to create a jowl-like bulge, but also slightly upward to flesh out the

side of the actor's lean face. Smith also reemployed the hair-thinning technique he had used on Walter Matthau in *The Sunshine Boys*. No appliances were used.

1984



Smith was honored with an Academy Award for his elaborate aging makeup on F. Murray Abraham in Amadeus.

Smith was approached to provide an unusual transformation for the John Carpenter production, *Starman*, an interspecies love story about an alien in human form trying to rendezvous with his starship. *In* an early sequence, the alien is introduced as a quasi-human baby that grows overnight to full adult size. Smith devised a means to achieve the rapid-growth effect in three separate stages, then persuaded Rick Baker and Stan Winston, working independently, to deliver the first two. He himself provided the final stage in which the alien transformed, in a single uninterrupted shot, from adolescence to adulthood. Using replacement animation, Smith fabricated more than one hundred full-size heads, each conveying a minute step in the transition. Beginning with lifecasts of Jeff Bridges – who would be playing the alien as an adult – and a twelve-year-old boy with somewhat similar features, Smith and a crew of four created intermediate forms by casting replicas in soft urethane that were then stretched and elongated, in tiny increments, using a mechanical armature. Molds were made of each stage and individual heads cast in rigid plastic for filming. Sculpting was employed to effect facial transition once the boy's head reached adult dimensions. Six months were required to complete the tedious endeavor. Photographed sequentially – each head occupying only a single frame of film – the result was a fluid, five-second transformation enlivened with eye blinks and a slight head turn. Smith was terribly disappointed when the shot was cut in two and abbreviated during postproduction.

Always in demand for old-age assignments, Smith was hired to design the makeup for William Hickey in his role as an elderly Mafia don in Prizzi's Honor, director John Huston's black comedy about a hitman who makes the mistake of falling for a woman in the same profession. Already in his late fifties, Hickey required only bleached hair and a light application of old-age stipple. *Robert* Laden, a frequent Smith collaborator, handled the day-to-day work on set.

1985-1986

After forty years in the makeup business – many of them as a mentor and informal teacher to beginners and colleagues alike – Smith decided to begin passing on the knowledge he had acquired more systematically by means of a comprehensive written course geared specifically toward the

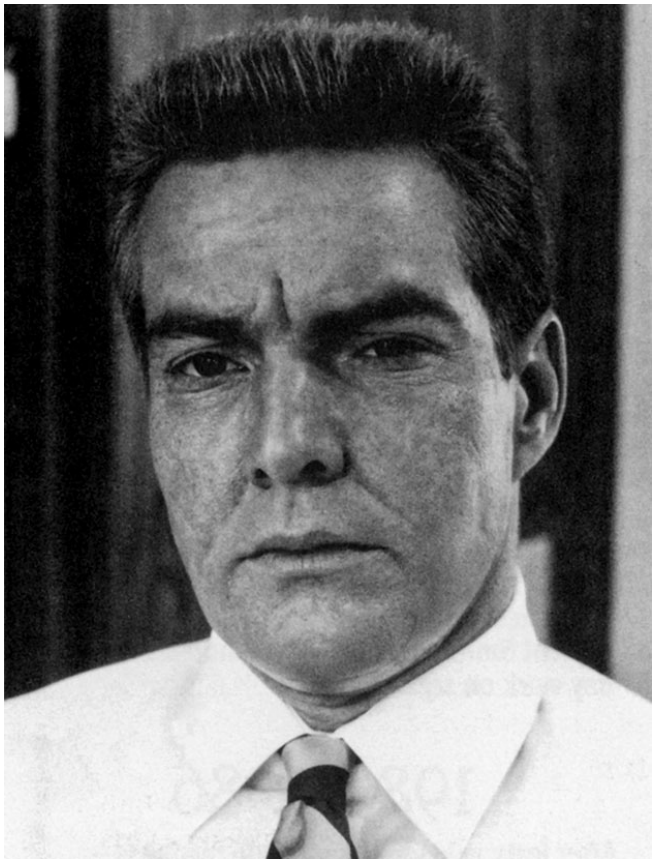
working professional and the occasional advanced amateur. He would spend much of the next two years developing the course.

One of his few interruptions was to work on North and South – an epic twelve-part television miniseries aired in two sections half a year apart – about two families in the turbulent period before and during the Civil War. Hal Holbrook had been cast in the role of Abraham Lincoln, and Smith welcomed the opportunity to work with the actor once again. Since Holbrook's facial structure bore little resemblance to his subject's, however, Smith had to be especially careful in designing the extensive appliances to produce a convincing Lincoln likeness. An oversight resulted in his accidental omission from the production's screen credits.

1987

Smith completed his 'Advanced Professional Make-up Course' – a comprehensive text of some five hundred illustrated pages detailing all aspects of creating appliance makeup and mechanical makeup effects – and commenced marketing it to students with demonstrated potential for advancement in or into the field. *In* subsequent years, the text has been updated with an additional hundred pages of information and supplemented with color slides and a videotape.

After a long hiatus, Smith returned to film with *Poltergeist* III – the final chapter in the horror saga of a family plagued by escalating supernatural disturbances – on which he was hired as a consultant and contributor to backstop two of his young protégés, John Caglione and Doug Drexler. While Smith characterized his participation as that of an idea man and kibitzer, he was directly involved in a number of key effects, including an appliance makeup on child actress Heather O'Rourke for an apparition in which she was to take on the appearance of an evil old preacher. He also contrived some refinements for a standard melting-head gag normally achieved via time-lapse photography of a wax or gelatin replica subjected to heat. Though Smith retained the essentials of the established approach, he added touches such as positioning the head horizontally and shooting down on it so that the melted wax would run around the back of the head rather than drizzling off the chin. At the same time, the paint he used formed a thin skin that remained intact as the wax flowed out from under it, creating the impression that the flesh was shriveling onto the skull rather than simply melting and dripping off. Smith also devised a simple string mechanism to suggest that the eyes were rolling up into the head just moments before melting.



Smith employed appliance makeup to subtly age Dennis Quaid to his mid-forties for Everybody's All-American.

Though cleverly conceived, the melting head was photographed indifferently and lost much of its impact.

Smith's next assignment was more sublime. For Everybody's All-American – a drama about a group of friends whose lives are chronicled from college to middle age – director Taylor Hackford wanted his characters to show signs of progressive aging, even though the time span of the film was only twenty-five years. For his role as a former athlete whose muscle has turned to fat, Dennis Quaid was fitted with appliances to fill out his face and a foam rubber stomach to fill out his shirt. As his college sweetheart and wife, Jessica Lange was already somewhat older than her costar. For her early scenes, therefore, she was subtly de-aged with permanently capped teeth and routine beauty makeup. Timothy Hutton – youngest of the three principals – required only minor appliance work to suggest middle-age. Supporting players similarly aged included John Goodman and Carl Lumbly.

1988

Juzo *Itami* – a successful Japanese filmmaker and actor with aspirations to produce a big-budget effects movie in the Hollywood style – approached Smith to participate in the making of Sweet Home. Smith agreed to consult on the project – primarily by fax – and upon his recommendation, makeup artist Tom Culnan was hired to establish a shop in Tokyo and produce the effects. As script pages came over the phone line, Smith realized that the slim ghost story plotline was only a weak excuse to support a procession of copycat effects from favorite American movies. There was even a character whose head turned around backward. Smith offered suggestions for improvement – some of which were accepted – but eventually succumbed to the momentum of the project. Just prior to principal photography, he flew to Japan for two weeks to lend moral support and assistance to the makeup crew. While there, he designed the makeup for *Itami* – playing a renowned parapsychologist – who informed the artist that he wanted to look like Charlton Heston. Though well mounted and brimming with fine effects, the film nonetheless failed to spark much interest in Japan and went unreleased in the United States.

Smith was concurrently engaged to consult on Monsters – an anthology of horror stories – which aired in syndication for three seasons. His principal function on the series was to devise low-budget means of fulfilling creature and makeup requirements – a task he much enjoyed because it demanded reliance on ingenuity rather than technology – and to then find qualified people to do the work. Smith found the show an excellent opportunity to promote some of the young talent he had nurtured over the years. Most of the work ended up being done by John Dods, whose speed and proficiency was such that little was required of Smith after the first season.

1989

Fifteen years after the second outing, Francis Ford Coppola mounted *The God father Part III*, reassembling many of the original films' cast and crew members. Twenty years were to have passed in the storyline, but since most of the actors did not look appreciably older, Smith was persuaded to design the requisite makeups for subsequent onset application by *Robert* Laden. His principal task was to age Al Pacino whose character was now in his sixties and in failing health. After considerable testing, Smith devised a makeup that employed subtle appliances and thinning hair, later rejected

in favor of old-age stipple and a graying crew cut. Smith ultimately withdrew from the picture and the simplified makeup was handled in Rome by Fabrizio Sforza.

Smith was called upon next to design the old-age makeups in Dad – a bittersweet drama in which a frail old man, played by Jack Lemmon, finds his world turned upside-down when his wife of many years suffers a heart attack, leaving him with no one but an indifferent grown-up son to look after him. Shortly after signing on to the production, Smith requested that a selection of photographs of Lemmon be sent to him for study. On a cel overlay attached to one of the shots, he designed a look for the makeup which was then approved by director Gary David Goldberg and the actor. Shortly before principal photography, using scissors and a magnifying glass, Smith repeated the thinning hair trick he had initiated years earlier on Walter Matthau. *It* would not be seen on film. Maintenance required removal of new growth with a fine-screen electric shaver that would cut the stubble but leave the longer hairs intact. *In* performing the daily ritual, however, the actor's wife unwittingly employed the wrong type of shaver – efficiently severing everything in its path. Lemmon played the part totally bald on top. Facial aging was simulated effectively with old-age stipple. Stipple was likewise employed on Olympia Dukakis for her role as the stricken wife. Once the makeups were deemed satisfactory, Smith left the day-to-day application to artists Ken Diaz and Greg Nelson. All three would receive Oscar nominations for the work.

Smith used the hair-thinning technique again on Jeremy *Irons* for his role as the enigmatic multimillionaire Claus von Bulow, accused of murdering his socialite wife in *Reversal of Fortune*. Smith also employed hair whitener and a bit of old-age stipple on the actor. As with his previous project, Smith was engaged only to design the makeup. On-set application for the Barbet Schroeder picture was performed by Allen Weisinger.

1990

Smith was called in as a consultant on True *Identity* – a comedy about an aspiring black actor masquerading as a white man to avoid extermination by the mob – when the producers began to worry that the trans-racial makeup being designed by John Caglione and Doug Drexler would not be convincing. Smith accepted the job, although it placed him in the awkward position of having to evaluate and critique the work of colleagues and friends. When he saw footage of the most current test makeup Caglione had devised, he surmised immediately that the producers' unfavorable reaction to it had more to do with a makeshift wig than with the makeup itself. Having learned that even the most experienced filmmakers will panic when they see an incomplete makeup, Smith was able to reassure the producers that the work was on track and that the final result would be satisfactory. He made no design input and only supported the existing makeup team.

1991

The main character in The Golden Years – a seven-part TV miniseries written by Stephen King and directed by Kenneth Fink – was an elderly janitor at a government research facility who is exposed to a substance that causes him to grow progressively younger. Since the only feasible way to do the show was to hire a young actor and make him up for his older scenes, Smith was approached to participate. He agreed to consult on the project and, on his recommendation, Carl Fullerton was hired as the principal artist. *In* a rare departure from the norm, Smith and Fullerton were asked to

suggest which of several actors being considered for the role would best suit their purposes. Their choice was Keith Szarabajka, who was indeed cast. Several stages of appliance makeup were created, with Fullerton doing the work.

Smith was next called upon to consult on *Death Becomes Her*, a black comedy from director *Robert* Zemeckis about a pair of feuding middle-age women who accept the promise of youthful immortality without first considering its unsavory consequences. For scenes in which Meryl Streep had to be aged about fifteen years, Smith recommended Kevin Haney, who provided some subtle appliances which were blended in place and combined with a traditional beauty makeup. Subtlety was not an issue for fellow artist Lance Anderson, who was commissioned to transform petite Goldie Hawn into bloated obesity through a combination of appliances and a jiggly fat suit made from a highly plasticized urethane discovered by Smith. For a scene in which Streep falls down a long flight of stairs – and lives, despite breaking her neck and twisting her head completely around – Smith tested ways of achieving her backward-facing head with prosthetics and animatronics. Zemeckis eventually opted to achieve the effect through digital means rather than physical.

1992

Smith next hired on as a consultant for Forever Young, a Steve Miner film in which Mel Gibson was cast as a test pilot who volunteers for a cryogenic sleep experiment, only to awaken some fifty years later. For a while he looks no older, but time eventually catches up with him and he undergoes an accelerated aging process. Greg Cannom did the principal appliance work – but the concept had to be softened a bit because of concerns on the part of the producer that making Gibson look too old would not be in keeping with his image as a romantic action star. Consequently, the makeup – which, storywise, should have aged the character to about ninety years old – was revised to make him look more like seventy-five.

During the year, Smith was invited to establish an ongoing makeup effects class – based on his "Advanced Professional Make-up Course" – at the Yoyogi Animation School in Tokyo. *In* addition to lecturing at the start of each school year, Smith spends six to eight weeks annually preparing an original appliance makeup demonstration – a commitment he relishes for the opportunity it affords him to experiment with new materials and techniques.

1993-1995

After nearly fifty years of doggedly resisting any suggestion that he move from his longtime residence and studio in New York, Smith uprooted and relocated with his wife to Florida. Though one of his first official acts after settling in was to establish a studio and workshop, the move must have sent a message to Hollywood – unintended by the artist – that he had decided to retire, for few job offers have followed him south.

A passionate advocate of makeup and its practitioners, Smith assiduously keeps current with technology and materials, incorporating the latest developments into updates for his encyclopedic text, recently rechristened "Advanced Professional Make-up Techniques." More than four hundred students in twenty-three countries have completed, or are enrolled in, the career-enriching program. His attendant course at the Yoyogi Animation School – since renamed the Multi-Media *Creation* Academy – is currently in its fourth year. On the motion picture front, Smith is presently

involved in preliminary discussions about the aging makeups required for I'm Not Rappaport – an upcoming Herb Gardner film starring Walter Matthau and Lou Gossett Jr. as park-bench eccentrics resisting the consequences of old age.

All photographs in this special tribute are from the personal collection of Dick Smith. Title page photograph by Angel Mora.

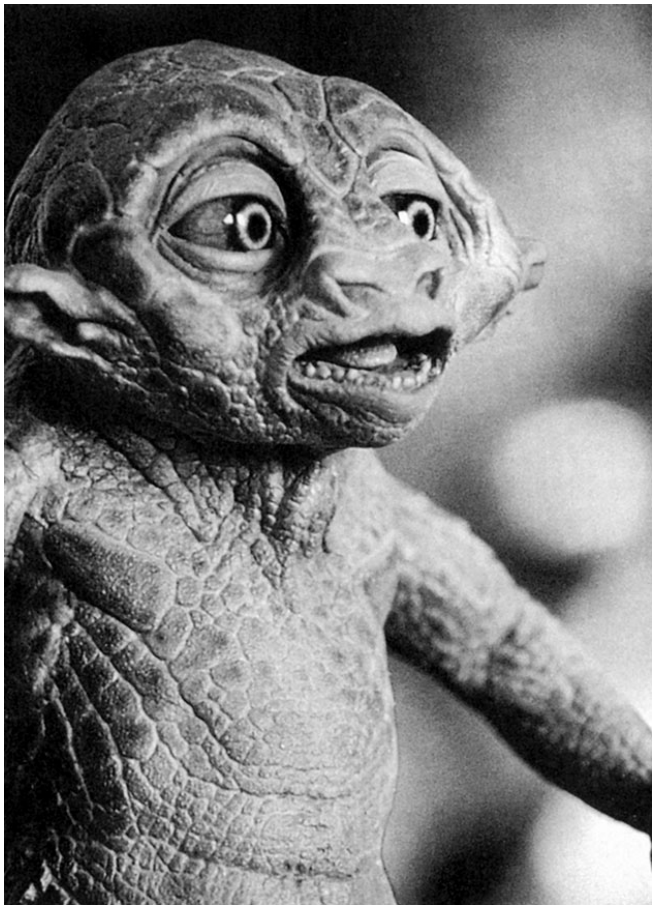
VIDEO BEAT
CANNOM CREATIONS

article by Mary C. Mason

On a planet light years from earth, Terrians, Grendlers and Kobas form an unlikely welcoming committee for human pioneers who have fled their space station outpost and a diseased home planet with the intention of colonizing a compatible world. Called upon to design and fabricate the indigenous creatures of Amblin's Earth 2 – the NBC TV series from Amblin Entertainment – was two-time Academy Award recipient Greg Cannom. Despite serious damage sustained by his Cannom *Creations* studio in the Northridge earthquake, Cannom accepted the challenge. Temporarily relocating his operation from Valencia to Sunland, Cannom began the task of producing an array of characters on a tight television schedule and limited budget.

With little more to go by than a story outline, Cannom devised a number of concepts for the creatures in both sculpture and sketch form. "The production had given me only a rough idea of what they had in mind, so *I* was free to play around with the designs. *I* really wanted to get away from the *Star Trek* or *Star Wars* kind of look and do creatures that were more realistic." Although pleased with his initial concepts, Cannom determined that the designs were too sophisticated for television. "They were very elaborate suits – different from anything *I*'ve done or seen before – but the production didn't want to spend a whole lot of time having to suit people up, so we simplified them quite a bit."

The tall, noble Terrians are a tribal group akin to Native Americans. Though bipedal and shaped essentially like humans, they live in an intricate network of caves beneath the planet's surface and tunnel effortlessly through sand and dirt. With that in mind, Cannom envisioned the creatures as having mole-like qualities, distinguished by small sensory appendages along the face and head and earth-tone coloration that would enable them to blend into their environment.



The cute-but-deadly Koba and the scavenging Grendler are two of the alien characters created by Cannom Creations for the Earth 2 series.

Once the Terrian designs were approved, the Cannom crew began construction of heads and body suits to be worn by actors. Required were six Terrians that would be seen only in the background and two hero characters that would be featured more prominently. With only five weeks remaining at the time Cannom received final approvals from the various echelons of production, he was forced to streamline the construction process. “For the background characters, we built a vacuformed face that was cut up into pieces. Glued onto it was a spandex head cover with a zipper in the back. Over that we glued a foam rubber face and head to form a one-piece mask. For the featured Terrians, two-piece appliances were sculpted, one for the head and neck and another for the jaw area. From those, mold maker Steve Proudy created plaster molds used to produce foam latex appliances.

The cute-but-deadly Koba and the scavenging Grendler are two of the alien characters created by Cannom Creations for the Earth 2 series.

For the Terrian bodies, Cannom devised suits based on a ‘one-size-fits-all’ philosophy. Rather than sculpt a customized suit for each performer, Cannom used a breakaway body cast of just one actor, and from that built modular components. “Everything else – arms and legs and so on – was sculpted separately and cast up in foam latex,” Cannom explained, “so all we had to do was take those foam pieces and sew them onto a spandex suit. Any visible seams were simply covered up with wardrobe.” The result was a suit which fit a wide range of performers, despite height differences of up to six inches in some cases. Textured warm tones were used to paint the separate pieces. “*I* used very earthy, blotchy colors, with actual dirt mixed into the makeup. *It* was all part of making the characters appear more realistic.”

In contrast to the towering, graceful Terrians are the stocky, ponderous Grendlers. Four or five feet tall, but able to carry seven times their own weight, they are nomadic scavengers scouring the planet in search of plunder, much to the aggravation of the earthlings. Sculptor Glen Hanz designed the Grendlers as upright rodent-like beings.

Massive suits were made by Linda Benavente-Notaro, using muscle pieces fashioned from foam sewn onto spandex body suits worn by the actors. The actors also wore 'cool suits' – vests lined with tubing through which temperature controlled fluid could be pumped – to prevent them from overheating. Slip latex rubber feet and foam latex hands completed the outfit.

Cave-dwelling Terrians are represented by actors wearing facial appliances and full-body suits.

The creature heads were fashioned from foam latex applied over fiberglass cores and outfitted with mechanics devised by Larry Odien. "The eyes, mouth and ears were all radio controlled," noted Cannom, "and because the head was so heavy, there was also a head mount that enabled it to turn when the actor inside turned his head." Because vision was obscured when the performers were suited up, small video monitors were placed inside the heads to enhance maneuverability. Even so, actors Jeff Deist and Lisa Ebeyer had to rely upon their athletic abilities to support the combined weight of the outfit and its gear while performing in the hunched positions dictated by the Grendlers' short stature.

At eighteen inches tall, the smallest member of the alien ensemble is the Koba, a cuddly creature with unsuspected lethal potential. *In* the pilot episode, a young colonist yearning to have a pet encounters the tiny Koba and forms an affectionate bond, unaware that Kobas defend themselves, when threatened, by projecting poisonous claws which induce a catatonic state in their victims.

"Originally, there was to be a mother Koba and a baby," Cannom recalled, "but the production decided to cut the mother and just leave the baby. They wanted the Koba to be more sympathetic and cute. *I* knew anything *I* came up with was going to be compared to *E.T.* or other such creatures, but we did a lot of designs. Glen sculpted some realistic little vermin creatures – but they weren't quite it. So *I* sat down, and in about an hour sculpted a Koba face that *I* liked a lot. Glen then finished it, sculpting the rest of the body and detail."

With more time allotted for the creation of the Koba than they had had for the Terrians, Cannon's crew made durable epoxy molds in which to cure their foam latex pieces. Because of their diminutive size, the Kobas were designed as puppet characters. Three versions were built. The first was an elaborate mechanical puppet operated via cable and radio control for free-standing shots. The second was designed for running scenes, with cams and gears devised by Larry Odien to create a running cycle. For such running scenes, the puppet was mounted on a motorized boom arm which was later removed digitally from the footage. The third Koba was a closeup rod puppet with radio controlled eye and jaw movements.

A last-minute addition to the Earth 2 project was the robot Zero, whose function in the story was to perform heavy labor and venture into areas too dangerous for human exploration. Allotted a mere four weeks to build the robot – another suit-type construct that would be worn by actor Teirre

Turner – the Cannom crew once again rushed to meet the deadline. Designed by Larry Odien, and sculpted by Moto Hata and Linda Frobos, the final product was fashioned out of fiberglass. “We had just enough time to do a whole body cast of the actor and finish it off,” Cannom related. “There were things *I* would like to have changed – such as using more spandex so the suit would be cooler and more flexible – but we just didn’t have time on this show to tweak it and get it absolutely right.”

Despite the constraints inherent in television production, Cannom is satisfied with the results of his crew’s on-the-fly efforts on behalf of Earth 2. “I’m happy with what we accomplished in the time we had. When you get to do a new show like this and you come up with characters and creatures that people enjoy, it is worth all the trouble.”